SOURCE WATER PROTECTION PROGRAM

TABLE OF CONTENTS

TABLE OF CONTENTS (CONT)

TABLE OF CONTENTS (CONT)

LIST OF TABLES

LIST OF FIGURES

LIST OF APPENDICES

SECTION 1

1.0 Introduction

The Montana Source Water Protection Program is intended to be a practical and cost-effective approach to protecting public drinking water supplies from contamination. A major component of the Montana Source Water Protection Program is termed *delineation and assessment*. The emphasis of delineation and assessment is identifying significant threats to drinking water supplies and providing public water systems with the information they need to protect their sources of water. Delineation is a process whereby areas that contribute water to aquifers or surface waters used for drinking water, called source water protection areas, are identified on a map. Geologic and hydrologic conditions are evaluated in order to delineate source water protection areas.

Assessment involves identifying businesses, activities, or land uses in source water protection areas where certain contaminants are generated, used, or transported and then determining the potential for contamination from these sources. Developing a program that completes delineation and assessment is mandatory for states under the federal 1996 Safe Drinking Water Act (see also section 10 for discussion about how Montana will meet this mandate). Delineation and assessment is the foundation of source water protection plans, the mechanism public water systems use to protect their drinking water sources. Although voluntary, source water protection plans are the ultimate focus of source water delineation and assessment. The program described in this document is designed to encourage public water supplies and communities to complete source water protection plans that meet their specific needs.

ELEMENTS OF THE MONTANA SOURCE WATER PROTECTION PROGRAM

- Roles and Duties of State and Local Entities
- Source Water Protection Area Delineation Methods and Criteria
- The Scope of contaminant Source Inventories
- Procedures for Assessing Susceptibility
- Descriptions of Assistance and Education Programs
- Requirements for Emergency Plans
- Requirements for New Public Water Supplies
- Public Participation

Montana uses the existing voluntary Montana Wellhead Protection Program (WHPP) developed under section 1428 of the 1986 Safe Drinking Water Act (SDWA) as a framework for developing and implementing the new requirements mandated by the 1996 SDWA. WHPP was developed to encourage public water systems (PWS) to develop written plans to protect drinking water sources through community planning. The seven elements of WHP; roles and duties, delineation, source identification, managing the protection area, contingency planning, new wells, and public participation, are retained in the Source Water Protection Program (SWPP). The core provisions added are mandatory delineation of source water protection areas, assessment of susceptibility of public water systems to contamination, making the assessments available to the public, and timetables for completion of these elements.

The name of the program has been changed to SWPP to reflect the newer more comprehensive approach. Montana developed SWPP by reviewing available sources of existing data at the federal, state, and local levels. Methods and criteria for completing assessments of all community and non-community PWS were developed pursuant to this review and are described in this document.

Also, methods that will be used to assess the susceptibility of PWS to potential contaminant sources are described. Through the new mandates, the program focuses funding available from set-asides out of the State Drinking Water Revolving Fund on identifying the most effective approach to protecting Montana's drinking water supplies.

Public participation and public right-to-know are central philosophies of SWPP. The program presented in this document was developed through an open process involving comments from a cross-section of interested parties. An advisory council with an associated technical working group provided formal review and comment during development of this document. Public meetings and an enhanced public participation campaign provided opportunity for less formal public participation. Another component of public participation incorporated into Montana's SWPP is public notification of source water assessments. Source water assessments will be made public through consumer confidence reports whenever possible and other media in an effort to notify citizens of potential threats to their drinking water sources. Knowledge of potential threats should provide motivation for voluntary management by local governing bodies. Assistance in developing source water protection plans also can provide motivation for voluntary management. Education of the general public and training for professionals working with PWS also is emphasized to support voluntary management efforts.

Montana's source water protection approach emphasizes a general goal of drinking water protection and benefit to public water supplies. Benefits to PWS will occur in several ways. Benefits will occur directly when the program provides maps and supporting data that identify the source water and potential contaminant sources within the source water protection area for each PWS. Benefits will also occur indirectly to PWS because the passthrough grant option encourages joint delineation and assessments for systems located close to one another or within watershed subareas. Protection of drinking water will occur as state and federal environmental regulatory agencies base decisions regarding state waters used for drinking on delineations and assessments. Protection will also occur as PWS utilize delineation and assessments as the foundation for completing local source water protection plans. Management strategies will be recommended in source water protection plans when PWS source waters are identified as susceptible to contamination. Also, source water assessments are intended to facilitate monitoring flexibility.

Criteria for delineating source water protection areas and the detail required in subsequent contaminant inventories depend on the sensitivity of the source water and the type of PWS. For example, surface water and unconfined groundwater sources are given special attention because they are sensitive to microbial and nitrate contamination, both acute health hazards. Less rigorous criteria are prescribed for transient noncommunity PWS because people are exposed for a limited time. A differential susceptibility assessment approach is outlined that targets immediate health hazards for all systems but targets long-term chronic health hazards only at community and non-transient PWS.

Implementation of SWPP will be coordinated among several programs at the Montana Department of Environmental Quality (DEQ). The Source Water Protection Section of the Pollution Prevention Bureau will have responsibility for meeting the source water assessment mandates of the 1996 SDWA but will work closely with the Public Water Supply Program of the Community Assistance Bureau to ensure the maximum benefit to PWS. The Resource Protection Planning, Water Protection and Monitoring, and Data Management bureaus also will have roles in helping local governing bodies implement SWPP. The goal of interbureau coordination is to ensure that SWPP is integrated in an overall watershed protection approach.

The *Montana Source Water Protection Technical Guidance Manual* (MBMG 1998) is a reference manual intended to more fully describe the six step process of developing a source water protection plan. Readers are encouraged to review the manual for details on how the program described by this document can be implemented. Copies can be obtained by contacting the Source Water Protection Section at DEQ (406 444-4806) or by visiting the training section on the Source Water Protection homepage at http://water.montana.edu/training/default.htm.

1.1 Source Water Protection Goals and Objectives

The Montana Source Water Protection Program adopts the goals stated in the Montana Constitution and the Montana Water Quality Act. The following is quoted from the constitution: "The state and each person shall maintain and improve a clean and healthful environment in Montana for present and future generations...[including] the protection of the environmental life support system from degradation..." (Article IX, Section 1). Further, from the Montana Water Quality Act: "It is the policy of this state to conserve water by protecting, maintaining, and improving the quality and potability of water for public water supplies..." (Montana Code Annotated (MCA) 75-5-101). The objective of SWPP is to protect and benefit PWS by delineating source water protection areas, by identifying potential contaminant sources and by assessing the susceptibility of water supplies to identified contaminant sources.

1.2 Montana Resources

Montana, the fourth largest state (147,046 square miles) in the United States, has approximately 879,000 residents and a population density of approximately six people per square mile. Montana is a rural state with seven major urban areas, the largest of which is Billings in Yellowstone County with 126,000 people. Fifty nine percent of Montanans live in these seven metropolitan areas. The majority of the remaining population lives in small communities located along alluvial valleys throughout the state. Approximately 618,800 residents or about 69 percent of the total population of Montana rely on a PWS for domestic use (community PWS). An even larger percentage of the population uses water from a PWS when considering the use of restaurants, businesses, schools, and campgrounds. Only approximately 15 percent of the 645 community PWS are associated with incorporated towns or cities and almost half of the community PWS serve fewer than 100 inhabitants.

Major industries in Montana are agriculture, timber, mining, tourism, and oil and gas production and processing. Manufacturers produce goods ranging from food to wood products, primary metals, petroleum, and coal. Major agricultural crops are wheat, barley, sugar beets, and hay. Livestock produced include cattle, hogs, sheep and poultry. Figure 1 shows how groundwater is used in Montana.

About one third of Montana's land is managed by the federal government. The largest single federal land manager is the U.S. Forest Service, which manages more than 26,000 square miles; primarily timbered land at higher elevations in the western third of the state. The Bureau of Land Management manages 12,600 square miles, primarily in the eastern half of the state. The Bureau of Indian Affairs and tribes manage more than 8,300 square miles on seven Indian reservations.

The Continental Divide bisects the state. The Missouri and Yellowstone rivers drain the eastern 80 percent of the state; the Kootenai and Clark Fork of the Columbia drain

most of the remainder. Perennial tributaries of the major rivers acquire water from surface runoff and groundwater seepage.

Montana contains three major groundwater regions based on landform and geology. These are known as the Western Mountain Region, Glaciated Central Region, and Non-glaciated Central Region. Generally, aquifers within these regions are further characterized as shallow surficial aquifers or bedrock aquifers. In all three regions the most important aquifers are found in the alluvial valleys of the major rivers (see Figure 2).

Alluvial valley aquifers consist of saturated sand and gravel deposits that commonly are hydraulically connected to perennial streams. These aquifers occur in clearly defined channels that normally do not extend beyond the floodplain and adjacent terrace. Well depths typically are less than 150 feet and the capacities of alluvial valley aquifers to transmit water are at least 10 times greater than adjacent formations. Total dissolved solids are usually less than 300 milligrams per liter owing to the relatively short residence time of water in these aquifers. In western Montana, very thick fine-grained glacial or basin fill deposits typically underlie alluvial valley aquifers. In eastern Montana, the alluvial valley aquifers are underlain by bedrock.

Older bedrock aquifers of Paleozoic and Mesozoic age supply water to PWS in much of central Montana. These water-bearing formations consist of limestone, fine-grained sandstone or siltstone, and are confined by overlying shales. Wells penetrating bedrock aquifers in eastern Montana are usually deeper than 150 feet and yield less water than alluvial aquifer wells. However, fractures and solution openings may occur in bedrock aquifers and increase groundwater yield. Water in bedrock aquifers is usually poorer quality than that found in alluvial aquifers with total dissolved solids ranging from 500 to 300,000 milligrams per liter.

1.3 Montana's Experience with Source Water Protection

1.3.1 Source Water Protection Demonstration Projects

Montana undertook six projects between 1989 and 1998 to demonstrate source water delineation and protection approaches (see Figure 3). 1) The first project, in Missoula, was funded by EPA in 1989 after the Missoula Valley Aquifer was designated a Sole Source Aquifer. 2) A project in East Helena coordinated by the Helena Valley Water Quality Protection District was undertaken to delineate source water protection areas for wells and an infiltration gallery near a stream. 3) The Park County planning department and the City of Livingston PWS undertook a cooperative effort to develop an ordinance appropriate for a small community. 4) A project in Choteau focused on delineating a source water protection area for a spring. 5) A project in Havre was initiated in 1998 to demonstrate Montana's source water protection approach for surface waters. 6) The town of Polson, located on the Flathead Indian Reservation, obtained funding from the Renewable Resource Development grant program administered by the Montana Department of Natural Resources and Conservation (DNRC). This project was a cooperative effort between the county planning department and the PWS. Also, a representative of the Confederated Salish and Kootenai Tribes participated on the source water protection committee. The source water demonstration projects in Missoula, Havre, and Polson are described more fully in the remainder of this section.

Missoula Source Water Protection Demonstration Project The project in Missoula was funded cooperatively by Mountain Water Company, EPA, the Missoula City/County Health Department and DEQ. The purpose of the project was to test effective delineation and management methods for adoption by the state wellhead protection program. The project also laid the groundwork for the public participation and education strategy that is a model for the Montana SWPP. The Missoula project was funded cooperatively by the major local water supplier (Mountain Water Company), EPA, the Missoula City/County Health Department, and DEQ.

Mountain Water Company supplies drinking water to 50,000 people in Missoula via 14,600 service connections. Missoula pumps from 7 to 10 billion gallons of water annually from an unconfined, alluvial aquifer with 34 wells ranging in depth from 125 to 170 feet. Most of the wells are within the city limits.

A numerical groundwater flow model was used to depict the zones of contribution to the PWS wells. Mountain Water Company delineated a source water protection area including all the possible zones of contribution to the city wells under varying pumping and seasonal conditions. The delineation extends to the physical and hydrologic boundaries of the aquifer upgradient of the wells. A simple analytical model was used to delineate zones of contribution for each well within the source water protection area. The upgradient distance was selected at 1,000 feet to correspond to a 30-day time-of-travel (TOT). A 200-foot buffer was added to the calculated lateral and downgradient boundaries.

Mountain Water Company developed media advertising campaigns for radio, television, newspapers, and billboards. The campaign highlighted the groundwater quality concerns associated with the Missoula aquifer and suggested citizens' action to address the issues. The Missoula City/County Health Department developed brochures, workshops and media presentations describing management of the Missoula Aquifer. The Missoula City/County Health Department also prepared maps that identify the location of sources of contaminants in relationship to the PWS wells. Mountain Water Company digitized the source location maps on a Computer Aided Drafting system to enable later incorporation on a Geographic Information System (GIS).

Mountain Water Company, in cooperation with the Missoula Chamber of Commerce, senior citizen groups and the University of Montana, developed a self-regulatory program for businesses called Missoula Water Partnership. Senior citizens and university students work with local businesses to complete inventories and management plans for regulated substances. Businesses that voluntarily comply with the best management practices (BMPs) developed in this cooperative effort are given stickers for their doors designating them as businesses that actively participate in preserving Missoula's aquifer.

A method to determine appropriate management for priority contaminant sources was developed from the Missoula project. Missoula’s experiences will help other communities sort through the variety of management approaches and determine which is best for their situation. Missoula enacted an ordinance that established pollution prevention requirements, a permit program, emergency response, siting requirements for wells, inspections, enforcement, and penalties. The Missoula Valley Water Quality District implements the permit system.

Havre Source Water Protection Demonstration Project Havre, a town of approximately 10,000 people in north-central Montana, obtains its drinking water from the Milk River. The goal of the source water assessment demonstration for Havre

was to identify initiatives that a local planning group could take to protect a surface water source. The objectives were to describe the Milk River Watershed, identify potential sources of contaminants, and prioritize potential contaminant sources for planning initiatives.

Emergency planning to respond to spills from highway and railway bridges into the Milk River immediately upstream from Havre was given a high priority. County ordinances to control or restrict construction in unsewered residential areas or to regulate siting of certain industrial facilities were identified as possible initiatives. For less significant sources of contamination, spill prevention procedures and BMPs implemented through education were encouraged.

Polson Source Water Protection Demonstration Project Polson is an incorporated town with approximately 1,800 service connections serving more than 4,200 people. The Polson PWS obtains water from both surface and groundwater sources. Groundwater comes from a semi-confined aquifer with all wells deeper than 150 feet. Polson delineated a zone of contribution to its wells using a semi-analytical model based on a 5-year TOT. The source water protection area extends beyond the city limits and includes reservation land. The Polson project provides an example of strategies for cooperative management of source water protection areas. The project benefits have extended into the late 1990s as Polson continues to use their source water protection plan as a guide in selecting new well locations.

Several additional source water protection projects have been initiated by local communities to address the variety of aquifer conditions and community types in Montana (Figure 4).

1.3.2 Nonpoint Source Control Demonstration Projects

School Demonstration Projects Source water protection areas were developed by an interdisciplinary school project with the children doing the work under the guidance of teachers. DEQ (at that time the environmental programs of the former Department of Health and Environmental Sciences) funded demonstration projects in three schools to protect their PWS wells. DeSmet Elementary in Missoula, Augusta High School and Bonner Elementary each established source water protection areas and documented the development process on video. The project was a valuable learning experience in science, math, social studies, composition, speech, and art. Also, the end products are significant assets to the schools and local communities. Videos of the process are available to other Montana schools starting source water protection projects.

The DeSmet Elementary School students produced an exceptional video. Region VIII of EPA selected the project to receive the President's Environmental Youth Award. In 1994 the school representatives went to Washington to meet President Clinton and receive a grant for $2,000 from Arm and Hammer Corporation for their outstanding effort.

The Montana Bureau of Mines and Geology (MBMG) sponsored a project entitled Groundwater Education in Rural Schools that also was funded by the Resource Indemnity Trust program; this project included the development of source water protection plans at eight schools around Montana.

Rural Demonstration Project The Montana Agricultural Chemical Groundwater Protection Act provides a general management plan to prevent chemicals used in agriculture from polluting the groundwater. A project to demonstrate ways to manage agricultural non-point sources of contamination began in 1993 in the Clarks Fork of the Yellowstone River valley, one of Montana's prime agricultural areas. BMPs intended to minimize non-point pollution were demonstrated under this project. Also, an assessment of public interest in source water protection and land use planning and a source water delineation for the town of Bridger were conducted under this project. The delineation for Bridger included a description of the hydrogeology of the valley and identification of source water protection areas.

Other Projects MBMG sponsored a project to complete delineation, assessment, and plan development for the towns of Dillon, Sidney, and Fairfield and the Hillside Hutterite Colony. The project also produced the *AMontana Source Water Protection Technical Guidance Manual"* intended to assist other PWS through the plan development process.

SECTION 2

2.0 Roles and Duties of State and Local Governments

DEQ has the responsibility to ensure that delineations and assessments are completed for all PWS within the time frame mandated by the Safe Drinking Water Act. Communities are encouraged to develop source water protection plans based on the delineations and assessments. The state will provide assistance and limited funding to support plan development activities and will coordinate source water protection activities of various state government agencies. Also, watershed protection and non-point source control activities that go beyond the scope of SWPP will be coordinated by DEQ. The roles of each group involved in completing a source water protection plan and methods for coordinating their activities are described in this section.

2.1 State Roles

The primary DEQ role under SWPP is to coordinate source water protection activities in Montana. DEQ works with local entities, other Montana and federal agencies, bordering states, tribal governments, and Canadian provinces to ensure that minimum criteria and deadlines specified under the Safe Drinking Water Act are met. DEQ regulates PWS, sewer systems, subdivisions, and industrial activities. Also, DEQ issues water quality permits and enforces the provisions of the Water Quality Act, and the Montana Ground Water Pollution Control System. Roles of specific state entities are described below.

2.1.1 Pollution Prevention Bureau, DEQ

The Source Water Protection Section administers SWPP, supports Local Water Quality Districts, provides coordination for comprehensive groundwater planning, and provides hydrogeologic expertise to other DEQ programs.

Montana Source Water Protection Section staff will:

Ensure delineation and assessment is completed for all PWS according to the timetable specified by EPA.

Develop and communicate incentives clearly to encourage participation. For example, use of economic incentives, such as the Treasure State Endowment funds to provide infrastructure for spring or well development is contingent upon a certified source water protection plan. Other economic incentives, such as additional eligibility for Conservation Reserve Program (CRP) designations, require a completed and certified source water protection plan.

Maintain an information and education program for communities across the state. Training in all aspects of source water protection will be provided to PWS operators and source water protection committees. The Source Water Protection Section organizes the Public Awareness and Education Action Plan (see Appendix E).

Make the results of the delineation and assessments available to the public.

Encourage local entities to delineate source water protection areas that protect all the water likely to be drawn into an intake under varying seasonal and pumping conditions. Cooperative management among local, tribal, county, state and federal agencies will be encouraged when the source water protection area lies outside the local entities' jurisdiction. Also, businesses will be encouraged to voluntarily participate in protecting source waters in a way that relies on persuasive information and common sense.

Prioritize communities for protection activities according to the sensitivity of their water supply and the total population affected. For example, surface water systems and wells in shallow unconfined aquifers are considered sensitive to contamination. These types of systems also often serve large populations. Properly constructed wells in deep, confined aquifers are considered least sensitive and affect a relatively small total population.

Implement a pass-through grant program whereby PWS may apply to DEQ for funds to complete delineation and assessment themselves, or select a contractor of their choice to complete the work.

Assist PWS with groundwater monitoring at selected locations for source water protection purposes.

Coordinate with federal, state, tribal and local entities to ensure implementation of the Statewide Management Program. Coordination is accomplished through assistance in the form of delineation and assessment, education, training, field services, and economic incentives.

Review source water protection plans for certification within 60 working days of receipt from PWS.

Compile and submit a biennial report to EPA describing progress, problems, and amendments to the program.

2.1.2 Technical and Financial Assistance Bureau, DEQ

The Water Pollution Control Revolving Fund and Drinking Water Revolving Fund sections of the Technical and Financial Assistance Bureau assist grant applicants, review plans and perform site inspections. They also administer the Federal Construction Grant Program and the State Revolving Loan Program. Personnel from the Water Pollution Control Revolving Fund Section also help coordinate training at DEQ=s biannual Water School and publishes Big Sky Clearwater which keeps water and wastewater operators informed about the source water protection program.

2.1.3 Community Services Bureau, DEQ

The Community Services Bureau provides data management, compliance monitoring and informal enforcement services, conducts sanitary surveys, and provides engineering plan review of proposed improvements to PWS to enhance water and wastewater infrastructure. The Public Water Supply Program provides training, inspections, and technical assistance services to Montana's 1,900 + PWS. The objective of this work is to assist PWS in maintaining or achieving compliance with current drinking water regulations.

The Public Water Supply Program implements the EPA approved monitoring waiver program and conducts vulnerability assessments for volatile organic chemicals. This program will also ensure that the assessment efforts are aligned with emerging regulatory flexibilities. For example, additional monitoring relief may be permissible when based on a history relatively free of contamination and a good understanding of each system's susceptibility.

2.1.4 Water Protection Bureau, DEQ

The Subdivision Program of the Water Protection Bureau reviews subdivision applications and plans for water supplies, sewage disposal, solid waste disposal and storm drainage. The program may recommend that proposed PWS wells be evaluated through a preliminary source water assessment. In addition, the program assists and trains local health departments in the design and review of water and waste water systems. The Public Water Supply and Subdivision programs jointly develop construction standards and review plans for new PWS wells.

2.1.5 Resource Protection Planning Bureau, DEQ

Activities of the Watershed Management Section of the Resource Protection Planning Bureau are focused on lakes and streams that have been identified as not meeting water quality standards or achieving beneficial uses (Clean Water Act, Section 303(d) list). The Watershed Management Section provides technical and financial assistance to various groups to identify problems with water quality, stream banks, and riparian zones and to develop, implement, and evaluate the effectiveness of water pollution control plans. Groups assisted by the Watershed Management Section include landowners, conservation districts, watershed advisory groups, forestry, agricultural and livestock organizations, industry, academic institutions, municipalities, EPA, and other state and federal land management agencies. This section provides financial and technical assistance for watershed management plans that are developed and implemented by local landowners, conservation districts, water pollution control districts, and watershed advisory groups. The control plans may be precautionary or voluntary in nature. Alternatively, they may incorporate permit limitations and specific reasonable land, soil, and water conservation practices (BMPs) designed to achieve water quality standards or restore beneficial uses. This section works with water pollution control partner agencies to develop Total Maximum Daily Loads (TMDLs) for

non-point pollution sources. TMDLs are pollutant load limits established for streams or lakes that fail to support beneficial uses such as fishing, drinking, recreation, and aquatic life. TMDLs specify the amount of each pollutant a waterbody can receive without violating water quality standards.

The Standards and Economic Analysis Section of the Resource Protection Planning Bureau coordinates rulemaking efforts, formulates and drafts environmental policies, guidelines and legislation, develops and revises air and water quality standards, provides expert advice on the health and environmental effects of air and water pollution, and conducts economic modeling and analysis. This section reviews and stays abreast of current research with regard to the health and environmental effects of all water pollutants including: heavy metals, carcinogens, toxic and bioconcentrating pollutants, nutrients, sediment, suspended solids, and pathogens. Section staff provides assistance in developing watershed management plans, conducting environmental assessments or environmental impact statements, issuing permits, or agency enforcement action on violations of the water quality standards.

2.1.6 Monitoring and Data Management Bureau, DEQ

The Monitoring and Data Management Bureau monitors ambient air and water quality statewide. In addition, they conduct several dozen intensive surveys each year to characterize sources and causes of air and water pollution and oversee volunteers that monitor water quality at 80 lakes. Monitoring staff also prepare statewide air and water quality assessment reports, compile lists of impaired water bodies, provide QA/QC services and field training, develop and document sampling and assessment protocols, maintain and calibrate monitoring equipment, and oversee monitoring performed by volunteers.

The Monitoring and Data Management Bureau also provides services that include modeling dispersion of air pollutants, conducting pollutant emission inventories, and modeling water chemistry. These services are provided to assist in the development of discharge and construction permits, and air and water pollution abatement plans, including TMDLs for water and State Implementation Plans (SIPs) for air.

Data management services provided by the bureau include development and maintenance of statewide air and water quality databases, automated data assessment tools, and department-wide data management systems.

2.1.7 Remediation Division, DEQ

The Remediation Division at DEQ provides oversight at contaminant sites that require long-term remediation, sites associated with spills, leaks, and underground storage tanks, and sites covered by Montana's Comprehensive Environmental Cleanup and Responsibility Act (CECRA). The various contaminants may include petroleum products from pipeline ruptures, products from spills associated with tanker truck wrecks, leachate from abandoned dumps, solvents at former dry cleaning facilities, transformer oil spills, and leaks from sewer lines. Most of these sites are handled by the Ground Water Remediation Program of the Hazardous Waste Site Cleanup Bureau and a few are handled by the Petroleum Release Section.

2.1.8 Coordination between DEQ Programs

Coordination between programs at DEQ occurs through daily interaction, weekly management meetings, informal information exchange, and through the participation of key personnel on the intra-agency watershed planning core team and inter-agency watershed coordinating council. DEQ's annual work plan, which is reviewed by EPA and incorporated in the State/EPA Performance Partnership Agreement, also supports coordination.

DNRC is responsible for developing the groundwater section of the State Water Plan. This comprehensive state groundwater plan recommends actions to improve public and private management of Montana's groundwater. The groundwater strategy presented in the plan was developed in close coordination at DEQ. It provides an overall management framework for sustaining the state's groundwater resources.

An MOU between DEQ and the Montana Department of Agriculture (MDA) outlines each agency's responsibilities that are mandated under the Montana Agricultural Chemical Groundwater Protection Act. The MOU provides protocols for notification when agricultural chemicals are detected in water supplies, exchange of groundwater monitoring data and joint sampling for agricultural chemicals.

Databases at DEQ (PWS, hazardous waste treatment, storage and disposal facilities, solvent handler inventory, Leaking Underground Storage Tanks/Underground Storage Tanks, solid waste, mine, Montana Pollutant Discharge Elimination System (MPDES)) are currently available for program use in the assessment process. Montana state government is in the early stages of converting existing databases to a new integrated system. In the meantime, a mechanism will be developed to ensure ready public access to these important DEQ databases through the spatial data clearinghouse at the Natural Resource Information System (NRIS). This mechanism also will be available to other DEQ programs.

2.1.9 Coordination between Regulatory and Non-regulatory Programs

The primary focus of most of Montana's water quality programs has been regulation of a particular point source or type of pollutant. For the most part, these are reactive programs addressing problems as they are discovered. The degree of threat that these problems present to PWS or the environment in general is not always considered. The source water protection section will provide information on source water protection areas to staff of state regulatory programs to ensure that high priority is assigned to cleanup of contamination and monitoring of contaminant sources within source water protection areas. Section staff also participate in watershed coordination efforts within and outside of DEQ to actively promote a comprehensive approach to resource protection. Active outreach and coordination is provided to conservation districts, local planners, watershed groups, technical service providers, and educators.

Non-point source control, watershed management plan, and storm water runoff management regulatory programs developed by DEQ strengthen management in source water protection areas. These programs conduct monitoring, issue discharge permits, and review plans and specifications. BMPs and conservation easements are common tools of these programs.

Surface water classifications established in the Administrative Rules of Montana (ARM) 16.20.604 to 612 declare certain drainages "A-Closed" to protect public health. A-closed waters are suitable for drinking after simple disinfection. No activities that might degrade water quality are allowed in A-Closed waters. A stream may be

upgraded to A-Closed by the Board of Environmental Review as recharge regions and streams that recharge aquifers are identified within source water protection areas.

Design and operation standards and site plan review have been incorporated into many state government programs. For example, the DEQ Public Water Supply Program sets standards and reviews public well construction and design and the Board of Water Well Contractors sets standards for well construction and design. DEQ reviews siting and design of major energy facilities, the State Revolving Fund (SRF) Section of the Technical and Financial Assistance Bureau reviews design and operation of water and wastewater systems, and the Community Services Bureau reviews design and operation of landfills.

The Montana Agricultural Chemical Groundwater Protection Act directs MDA and DEQ to design site-specific management plans where agricultural chemicals have been detected in the groundwater above established trigger concentrations. The Pollution Prevention Bureau implements several voluntary programs that stress waste source reduction, reuse, recycling, composting, and incineration. Infectious wastes, household hazardous waste, and motor oil are specific wastes targeted for voluntary programs.

2.2 Local Roles

2.2.1 Source Water Protection Plan Development

Source water protection plan development is a voluntary extension of the source water assessment program. Plan development is a local effort, which builds on information provided in the delineation and assessment. County sanitarians, water and wastewater operators, elected officials, city/county health officials, fire marshals, county extension agents, weed control boards, city/county planners, and resource conservation and development professionals are among those who have important roles in establishing and managing source water protection plans. They can organize or participate in source water protection committees that oversee the development of source water protection plans.

Operators of PWS also have an important role in managing both source water protection areas and water distribution networks. The operators are valuable participants in source water protection committees as well as important sources of information on groundwater quality, well construction, and maintenance. See the *Montana Source Water Protection Technical Guidance Manual* (MBMG 1998) for additional information.

Valuable members of source water protection committees also may include members of Montana Rural Water Systems, Northern Plains Resource Council, Alternative Energy Resource Organization, Montana Water Well Association, Montana Environmental Health Association, Montana Chapter of the American Water Resources Association, and the American Water Works Association. Significant contributions to source water protection also can be made by service organizations, senior citizen groups, youth groups, school personnel, public interest groups, advocates of vulnerable populations such as people with weakened immune systems who may be more susceptible to water pollutants, business groups, tribes, land conservation groups, farmers, and developers.

2.2.2 Implementation of Source Water Protection Plans

Source water protection plans will be implemented by local entities including city or county governments, conservation districts, water districts, school administrations or boards, water user associations, homeowner associations, businesses, federal and state land management agencies, water conservancy districts, and local water quality districts. These entities will initiate source water protection plans, provide and administer the funding by applying for grants and assessing fees, and manage the source water protection area. Immediate benefits from their effort may come in monitoring or treatment waivers. However, the primary benefit is the long-term viability of source water for a PWS.

Local entities that share an aquifer, drainage, or area may establish and manage a source water protection area jointly through an inter-local agreement (Title 7, Chapter 11, Part 101 et seq.). In areas with documented contamination problems, local water quality districts may be formed to protect, preserve and improve water quality. Water quality districts develop and submit programs for approval by the Board of Environmental Review (Title 7, Chapter 13, Parts 4501-4529). Existing local water quality districts may initiate, fund and implement a source water plan as part of its water quality program.

Multi-jurisdictional source water protection areas are common in Montana. Pursuant to the MCA, municipalities may regulate areas outside their city limits. However, only 90 PWS are associated with municipal governments. Local entities without land use authority must rely on county governments if new regulations are needed in their source water protection areas. Additionally, cooperation between local entities and federal land management agencies is needed to manage source water protection areas in some rural areas of Montana because of extensive federal land ownership.

If county and local entities choose to implement source water protection plans through a Local Water Quality District, the district is required to consult with DEQ to develop a program that is effective in protecting, maintaining and improving the quality of state water. A water quality district can implement a program following a public hearing and approval by the Board of Environmental Review. A program must include a description of the water quality district, descriptions of water and land resources and potential sources of contamination within the district, a list of water quality goals and proposed projects, and an analysis of potential adverse impacts to the environment.

2.3 Federal Roles

According to the Safe Drinking Water Act, Title XIV-Section 1428(h), federal government agencies having jurisdiction over any potential source of contamination identified by a state Wellhead Protection Program shall be subject to and comply with all requirements of the state program. Compliance under this act must be in the same manner and to the same extent as any other property owner, including the payment of reasonable charges and fees. DEQ is responsible for completing delineation and assessments for PWS operated by the following federal agencies: Forest Service, Bureau of Land Management, National Park Service, Border Patrol, and Bureau of Reclamation. Federal agencies are encouraged as PWS operators to establish source water protection plans. In addition, federal agencies will be encouraged to participate on source water protection committees where their land is within source water protection areas of non-federal PWS.

Montana Rural Water Systems Inc. (MRWS) uses EPA funds to assist small PWS in completing source water protection plans. An MRWS groundwater technician is contracted by EPA to assist PWS in developing source water protection plans. Also, MRWS is required

under the EPA contract to set aside a certain number of hours to address priorities established through an annual forum with EPA and Montana DEQ.

2.4 Coordination between State and other Governments

2.4.1 Coordination between State Agencies and Community Planning Teams

Coordination between state and local entities is an integral part of the SWPP. DEQ will provide technical assistance and training and educational materials such as videos, groundwater flow models and brochures to communities. DEQ will assist local entities with the help of MBMG, DNRC, and NRIS. Areas of assistance include gathering scientific data on source waters, delineating source water protection areas, and identifying locations for new wells. DEQ also will provide information on site-specific strategies to effectively manage source water protection areas.

DEQ will train local groups to establish source water protection plans for PWS, and will distribute information regarding regulatory programs and development and implementation of a source water protection plan. DEQ also will hold public meetings and inform citizens through the news media about source water protection plans and inform local entities of funding sources and methods to apply for them. Appendix E includes the DEQ Public Awareness and Education Action Plan.

Municipalities and county governments are authorized through various citations in the MCA to manage threats to the quality of their source water. Additionally, DEQ will implement many of the recommendations of the Groundwater section of the Montana Water Plan.

MBMG evaluates Montana's aquifers under the Groundwater Assessment Act (MCA 85-2-901 to 907). The Groundwater Assessment Steering Committee prioritizes aquifers for study.

2.4.2 Coordination between State and Federal Agencies

Federal lands are managed by several agencies including the Forest Service, Bureau of Land Management, Bureau of Reclamation, and Park Service. The watershed or recharge area of many community PWS is under jurisdiction of one of these federal agencies. In addition, these agencies operate many non-community PWS. DEQ will coordinate with federal agencies to develop source water protection plans for their PWS and to facilitate cooperative management of the source water protection areas of nonfederal PWS.

2.4.3 Coordination between State and Tribal or International Agencies

DEQ will coordinate the SWPP with similar programs that may be developed by the seven tribal governments whose reservations lie within Montana and upon their request. These are: Crow, Northern Cheyenne, Confederated Salish/Kootenai, Blackfeet, Chippewa/Cree, and the Ft. Belknap and Ft. Peck tribes. Tribally owned and operated water systems are not subject to state jurisdiction but DEQ will provide technical assistance with source water protection upon written request. The State-Tribal Cooperative Agreements Act (Title 18, chapter 11, part 1, MCA) authorizes public agencies, including cities, counties, school districts, and other agencies or departments of the state, to enter into cooperative agreements with Montana's tribal governments.

The border with Canada has several areas of concern to both countries. Aquifers are shared and groundwater flow occurs in both a northerly and southerly direction at different locations along the border. The headwaters of the Milk River are in Montana but the river flows through Canada prior to re-entering Montana where it is an important surface water source for several PWS in the north-central part of the state. Where necessary due to hydrologic or hydrogeologic conditions, Montana will arrange international cooperation through U.S. EPA.

2.5 Certification of Source Water Delineation and Assessment Reports

Delineation and assessment reports completed by DEQ or a PWS under contract with DEQ must include information described in Appendix J. Source water protection areas must be delineated, potential contaminant sources must be located, and susceptibility must be assessed for all significant potential contaminant sources according to methods and criteria specified in this document.

Reports completed under contract by a PWS and submitted to DEQ will be reviewed within 60 days and returned if deficiencies are found. Decisions on final certification will be made by DEQ within 45 days after a PWS has corrected deficiencies to the satisfaction of DEQ.

2.6 Certification of Source Water Protection Plans

PWS are required to submit their source water protection plans to DEQ for review and certification. The purpose of review and certification is to verify that source water protection plans meet requirements of the Safe Drinking Water Act and SWPP.

In order to be certified, a source water protection plan must include all information required by the Safe Drinking Water Act and the SWPP including susceptibility assessments. If a report is certified, the PWS will receive a certificate signed by the supervisor of the Source Water Protection Section within 60 days after DEQ receives the plan. If a report is incomplete or does not meet minimum requirements, Montana Source Water Protection Section staff will notify the PWS of the deficiencies within 60 days of receiving the plan and will work with them to correct deficiencies. DEQ will review certified source water protection plans at 5-year intervals when updated contaminant source inventories are due. Certification will be suspended if a PWS fails to update its inventory. Five-year updates of previously certified plans will include susceptibility assessments for each new identified potential contaminant source and each active water source. Susceptibility to all potential contaminant sources must be assessed for sources of water that were put in use within the previous five years.

REQUIRED INFORMATION FOR SOURCE WATER PROTECTION PLANS

Description of the characteristics of the community, public water supply, and water source.

List of the key individuals and groups that participated in decision-making, and those who will implement the source water protection plan.

Current information on construction of wells or surface water intakes including recent sanitary survey information and maintenance records.

Well yield and a well log for groundwater sources.

Engineering drawing of the water intake for surface water sources.

Methods, criteria, and sources of information used to delineate source water protection areas.

Map showing locations of water intakes and boundaries of source water protection areas.

Contaminant source inventory of the source water protection areas in proper format for inclusion in a statewide database.

Susceptibility assessment for each combination of significant contaminant source and water

intake.

Management options chosen including a copy of any ordinances adopted.

Statement of the goals of management actions and a time frame for implementation and evaluation.

Emergency response plan.

Information necessary to evaluate applications for waivers of monitoring or filtration requirements.

SECTION 3

3.0 Delineation of Source Water Protection Areas

Source water protection areas are divided into regions according to the time water takes to reach a PWS intake. The purpose of subdividing source water protection areas in this way is to prioritize source water protection efforts. By focusing efforts on potential contaminant sources nearest to their water supply, communities can use limited resources most effectively. Source water protection regions defined in this chapter are: the control zone, inventory region, and recharge region for groundwater sources and the spill response and watershed regions for surface water sources.

Source water protection areas for groundwater based systems will be delineated according to accepted methods under section 1428 of the SDWA . Recommended methods and minimum criteria for delineating source water protection areas are described in this section and Table 1. Delineation methods and criteria are presented for community PWS that obtain water from unconfined aquifers, confined aquifers, surface waters, and sources that use groundwater and surface water conjunctively. Delineation methods to identify source water protection areas for non-community PWS are described separately.

PWS may delineate the subregions of their source water protection area using an analysis that is more in-depth than that described in this section. For example, a numerical groundwater flow model or stream flow model can be used. For detailed information on alternative delineation approaches, see *Guidelines for Delineation of Wellhead Protection Area*s (EPA 1987), *Delineation of Wellhead Protection Areas in Fractured Rock* (EPA 1991), or *Handbook of Ground Water and Wellhead Protection* (EPA 1994). Additional information also is available from EPA on its Source Water Protection Internet site (http://www.epa.gov/safewater/protect.html) . The U.S. Army Corps of Engineers develops software and can provide information on runoff and stream flow modeling at its Internet site (http://www.wrc-hec.usace.army.mil/).

3.1 Rationale for Source Water Delineation Methods and Criteria

The methods and criteria used to develop source water protection plans are tailored to the unique character of Montana's PWS and the nature of the source waters available to them. Sixty percent of community PWS in Montana serve 100 or fewer people. These small supplies have very limited financial and staff resources. Consequently, the methods and

criteria presented here are designed to be cost-effective so resources can be directed toward effective management of source water protection areas.

During development of WHPP, DEQ (the environmental programs of the former Department of Health and Environmental Sciences) ranked potential delineation criteria using a matrix provided by EPA. The most appropriate criteria for delineating source water protection areas for aquifers found in Montana were identified using these ranks. EPA's potential delineation criteria ranked from most to least appropriate are: distance, groundwater flow boundaries, time-of-travel (TOT), drawdown, and assimilative or natural attenuation capacity. Montana's program uses distance, groundwater flow boundaries, and TOT for groundwater sources. The criteria used to delineate source water protection areas for surface water sources are distance, watershed boundaries, and TOT.

Delineation approaches for wells intercepting multiple aquifers are not specified because ARM (36.21.650) prohibit construction of wells that allows deleterious interflow between aquifers. Under these rules, an aquifer is defined as any discrete water-bearing unit with a specific water chemistry, temperature, or hydrostatic head (ARM 36.21.634). Deleterious interflow is deemed to occur if any of these parameters are changed in an aquifer because a well provides a conduit for flow from another aquifer. No concerted effort has been made to locate wells interconnecting multiple aquifers or to plug and abandon them.

Effort will be made to match boundaries of source water protection areas to physical or political boundaries, such as a stream or river, city limits, streets, or section lines in order to facilitate management decisions. Notwithstanding, boundaries will include at least those areas delineated using criteria listed in Table 1.

3.2 Methods and Criteria for Delineating Source Water Protection Areas for Groundwater Sources

Groundwater sources are dug, drilled, bored, or driven wells, infiltration lines (including Ranney collectors), and spring boxes. Source water protection regions for groundwater sources consist of the control zone, inventory region, and recharge region. These regions are defined with the intent that they receive different types and levels of management depending on the likelihood that contaminants will reach a water intake. The control zone is the most critical area in the vicinity of a PWS where direct introduction of contaminants into the water intake or immediate area can occur. All land use activities will be inventoried within the control zone. The Inventory Region encompasses the area expected to contribute water to a PWS within a fixed distance or a specified groundwater travel time (Figure 5). State and federal databases of potential contaminant sources will be inventoried and land uses will be identified in the inventory region. The recharge region is generally the entire area contributing recharge to groundwater that may flow to a drinking water supply over long time periods or under higher rate of usage. General land uses and large industrial facilities including mines will be identified in the recharge region by searching state and federal databases pertaining to contaminant sources.

3.2.1 Control Zone

The goal of management in control zones is to protect sources from damage and to prevent direct introduction of contaminants into sources or the immediate surrounding area. PWS or other local entities manage control zones. Ownership, easement, or lease of the land immediately surrounding water intakes is usually necessary to control access and eliminate possible use of chemicals nearby. Examples of contaminant control methods are: fencing the property, proper chemical storage, sloping the land surface away from a well, and building a secure well house.

Control zones are areas that lie within a fixed distance of a groundwater source.

3.2.2 Inventory Region

Management in inventory regions will be focused on pollution prevention activities where water is likely to flow to a PWS well intake within a specified time-period. The goal of management in inventory regions is minimizing susceptibility to contamination. Management actions may address specific contaminants such as microbes, nitrate, fuels, solvents, pesticides and herbicides, or specific metals. Local regulations may be developed and implemented to prohibit storage or use of certain potential sources of contamination or to require leak detection monitoring or secondary containment for chemical storage tanks. Houses on septic systems can be hooked up to a public sewage treatment system, or BMPs can be implemented to control non-point sources of contamination.

Inventory regions for sources in confined aquifers will extend fixed distances from wellheads. Inventory regions for unconfined aquifers will be delineated for a specified TOT using an analytical method. The area that is delineated in this way, called the zone of contribution (ZOC), encompasses all areas or features expected to supply groundwater recharge to a PWS well within the specified time. In cases where TOT distances are less than 1,000 feet the upgradient extent of inventory regions will be 1,000 feet. The distance can be shorter than 1,000 feet only if an aquifer flow boundary is encountered. EPA recommends calculating TOT distances using uniform-flow equations (EPA 1993) as the basic analytical method for delineating ZOCs. A description of other analytical methods available for determining ZOCs can be found in Appendix H. Semiconfined groundwater conditions may be encountered in deeper portions of alluvial valley or fractured bedrock aquifers. At locations where groundwater is semiconfined, it is necessary to use delineation methods for unconfined aquifers.

TOT criteria will not be used to delineate inventory regions in unconfined bedrock aquifers where preferential flow may occur along fractures or solution openings. Instead, inventory regions will be delineated by upgradient boundaries of unconfined portions of fractured or carbonate source aquifers. Inventory regions of wells in fractured or carbonate aquifers that are confined will extend a fixed distance, the same as for other confined aquifers.

3.2.3 Recharge Region

The goal of management in recharge regions is to maintain and improve the long-term quality of groundwater used by PWS. Recharge regions will include all land overlying the aquifer but outside the inventory region. Sources of contamination can be limited or controlled, BMPs can be implemented, and public education programs can be organized. Land use agreements and site plan reviews are additional tools of

protective management. Where recharge regions straddle boundaries with other states, Canada, or Indian reservations, assistance from EPA will be requested to facilitate protection activities. Recharge regions will be delineated by mapping physical and hydrologic boundaries that limit flow to groundwater sources. Groundwater flow boundaries typically coincide with streams, geologic formation contacts, faults, aquifer outcrops, and topographic divides. Contacts between alluvial valley aquifers in western Montana and adjacent mountainsides will usually be delineated as groundwater flow boundaries because hydraulic conductivities differ significantly between formations. Outcrops in isolated mountain ranges will usually define the boundary of confined aquifers in eastern Montana. Shifts of groundwater divides that result from human activities near PWS wells will be evaluated when determining flow boundaries. Irrigation of cropland by flooding and large capacity wells are examples of human activities that can shift groundwater divides.

3.2.4 Nonadjacent Recharge Areas for Confined Aquifers

Confined aquifers underlying the plains of eastern Montana receive recharge where they outcrop in distant, isolated mountain ranges. The Source Water Assessment Advisory Council specifically recommended including nonadjacent recharge areas in source water protection areas. Following their recommendations, outcrops of confined or semiconfined aquifers will be identified as areas of concern. Nonadjacent recharge areas will be managed as recharge regions and land uses and large industrial facilities will be identified therein. Exploitation of precious metals deposits and sources of other renewable and non-renewable resources that often are found in these isolated mountain ranges are of particular concern. The method recommended for delineating nonadjacent recharge areas is hydrogeologic mapping.

3.3 Delineation of Source Water Protection Areas for Surface Water Sources

Source water protection areas for surface water sources will be delineated according to the methods and criteria described in this section. Two different regions, the spill response region and the watershed region, are identified with different management goals. Management in the spill response region will focus on the threat of potential chemical spills and sources of microbial contaminants. State and federal databases of all potential contaminant sources will be inventoried and land uses will be identified in the spill response region. The watershed region is a much larger area that will be managed to protect the long-term quality of drinking water sources from large point contaminant sources and non-point sources. General land use, Montana Pollutant Discharge Elimination System (MPDES) permit holders, pipelines, and large industrial facilities including mines will be identified in watershed regions by searching state and federal databases of potential contaminant sources.

3.3.1 Spill Response Region

Spill response regions are similar to control zones for groundwater sources in that they are designated to prevent releases of contaminants where they can be drawn directly into a water intake with little lag time. However, the level of control prescribed for control zones is not possible for the much larger spill response regions. Instead of control by ownership, emergency response and spill prevention plans may be developed or regulations may be developed to control potential sources of contamination. Parkways can be dedicated to filter runoff and increase infiltration and containment barriers can be constructed to prevent chemical spills on roads or railways from reaching surface waters.

Spill response regions will extend one-half mile downstream and ten miles upstream from intakes and include half-mile-wide buffers adjacent to all shorelines (Figure 6). Alternatively, buffers can be as narrow as 1000-feet wide but only if they correspond to physiographic features defined by land slope, soil characteristics, or vegetation. Buffers for stream sources will extend up major tributaries a total of 10-miles from the intake. Buffers along tributaries of reservoirs will not extend past one-half mile from the reservoir.

Spill response regions will not extend outside the watershed, except in cases of inter-basin transfer. Spill response regions in the case of inter-basin transfer will extend a total of 10 miles upstream from an intake.

3.3.2 Watershed Region

The goal of management in watershed regions is to maintain and improve the long-term quality of surface water used by PWS. Watershed regions will include all land and water contained in the drainage basin upstream of surface water intakes. These regions can include thousands of square miles for PWS along the Missouri and Yellowstone rivers. Consequently, to manage watershed regions effectively the state will be divided into four regions defined by the DEQ Watershed Management Section (Figure 7). Efforts will be made to cooperate with bordering states, Indian reservations, and Canada in managing watersheds that extend outside the state's responsibility under SWPP. Watersheds cross state borders in the upper reaches of the Yellowstone, Missouri and Milk rivers, however, the City of Havre is the only PWS that draws water from a surface water source near the state's border. There will be several PWS, however, where transboundary cooperation with Native American tribes will be necessary. Assistance will be requested from EPA to coordinate contaminant source inventories with Canadian provinces and to facilitate management of source water protection areas that cross reservation boundaries.

Management of watershed regions will be addressed through the State Water Plan because of the large areas involved. The State Water Plan is required by state law to "...set out a progressive program for the conservation, development, and utilization of the state's water resources." Actions to maintain or improve water quality will primarily be conducted through existing programs. Section 319, Nonpoint Source Program, and Section 303d, TMDL Program of the Clean Water Act, will be the primary mechanisms used. Under the TMDL program, MPDES discharges may be limited or controlled and/or BMPs may be required for non-point sources of contaminants. Other watershed management initiatives facilitated by DEQ may include public education programs, land use agreements, water quality monitoring, and site plan reviews of major industrial facilities.

3.4 Conjunctive Delineation of Groundwater and Surface Water

Procedures for conjunctive delineation apply when groundwater and surface water are hydraulically connected. Groundwater and surface water are considered hydraulically

connected if a stream, lake, or reservoir overlies or is in contact with an unconfined alluvial valley aquifer or an outcrop of a carbonate or fractured rock aquifer. The methods used to delineate inventory regions for groundwater sources and sources classified as ground water under the direct influence of surface water (GWUDISW) will differ from the standard groundwater delineation method where groundwater and surface water are used conjunctively.

In addition to groundwater ZOCs, inventory regions for groundwater sources will include ½ mile buffers around surface waters that are hydraulically connected to source aquifers and located within 3-year TOT of a PWS well. Buffer zones will extend 10 miles upstream from the groundwater ZOCs or to watershed limits, whichever distance is shorter. A complete inventory of state and federal databases of potential contaminant sources will be conducted in the groundwater ZOC. State and federal databases will be inventoried to identify general land uses and sources of microbial contaminants within the surface water buffer. Microbial contaminants typically originate from concentrated animal feeding operations, septic tanks, class V injection wells, municipal sanitary sewers, and wastewater treatment facilities.

Inventory regions for sources classified as GWUDISW will be delineated by ZOCs corresponding to 3-year TOTs, similar to groundwater sources. In addition, inventory regions for GWUDISW will include ½ mile buffers around associated surface waters for 10 miles upstream of the groundwater ZOCs or to watershed limits, whichever distance is shorter. A complete inventory of state and federal databases of potential contaminant sources will be conducted in groundwater ZOCs. State and federal databases will be inventoried to identify general land uses and sources of microbial contaminants within the surface water buffer.

Spill response regions for surface water sources will include aquifers within delineated buffer zones that are hydraulically connected to surface water sources. State and federal databases of potential contaminant sources will be inventoried and land uses will be identified in spill response regions.

3.5 Delineation of Source Water Protection Areas for Non-community Public Water Supplies

Non-community PWS are defined as those that serve 25 or more persons per day but do not regularly serve the same persons for at least six months a year. This group includes rural schools and hospitals, businesses, campgrounds, motels, restaurants and highway rest stops. Non-community PWS are the largest segment of regulated PWS in Montana. Approximately 1,300 out of 1,900 PWS are classified as non-community. Except for children at rural schools and employees of businesses, non-community PWS primarily serve transient populations.

At a minimum, control zones and inventory regions for Non-community PWS wells will be delineated as fixed radius circles (see Table 1). Spill response regions consisting of half-mile-wide buffers will be delineated around reservoirs and along streams for 10 miles upstream from surface water intakes. More in-depth analyses

using the methods and criteria described for community systems may be required where non-community PWS are ranked as highly susceptible to contamination.

3.6 Additional Delineation Requirements for Filtration Waiver Applications

Preliminary analyses of groundwater sources that may be under the direct influence of surface water will be conducted by DEQ=s Public Water Supply Section for all PWS wells prior to delineating source water protection areas. Wells that score 40 or greater on a preliminary analysis must be evaluated to determine whether they should be classified as GWUDISW. If a source is classified as GWUDISW a Watershed Plan as specified in DEQ Circular PWS-3 will be required to provide information sufficient to evaluate an application for a filtration waiver.

If your public water system classification is:	And your Aquifer Type is:	Then your Source Water Protection Regions are:	You Can use this Delineation Method for each region:	And Your delineation Minim
Community	Unconfined or	Control	Fixed radius	100 feet from wellhead
		Inventory	Analytical method	Larger of 1,000 feet upgr mile-wide buffers arc surface waters for 10
Community	Confined	Control	Fixed radius	100 feet from wellhead
		Inventory	Analytical Method	1000 feet from wellhead
Community	Surface water	Spill Response	Fixed distance	0.5 mile-wide buffers ext corresponding to a 4 whichever is greates
Non-community	Groundwater	Control	Fixed radius	100 feet from wellhead
Non-community	Surface water	Spill Response	Fixed distance	0.5 mile-wide buffers ext

Table 1. Methods and criteria for delineating source water protection regions for PWS.

SECTION 4

4.0 Inventory of Potential Contaminant Sources

Inventories of potential sources of contamination will be conducted to assess the susceptibility of drinking water sources to contamination and to identify management options. Source inventories will concentrate on potential sources of contaminants that are the greatest threat to health. All facilities, activities, or land uses where a contaminant is present that may be released to a drinking water source in quantities sufficient to threaten human health will be identified as potential contaminant sources. Potential drinking water contaminant indices identified by EPA will be the main reference used to identify potential contaminant sources (see Appendix K). Sources of all primary drinking water contaminants and cryptosporidium will be identified where practical, however, the contaminants of greatest concern in Montana are nitrate, microbial contaminants, solvents, and pesticides. Metals are of concern in certain areas.

4.1 Known Groundwater Contamination in Montana

Approximately 126,000 individual on-site septic systems are used by 252,000 people in Montana. Septic systems are believed to cause substantial, widespread nutrient and microbial contamination to groundwater. Groundwater monitoring in Montana has shown elevated nitrate levels near areas of concentrated septic systems (Drake 1995). Nitrate levels at or above 10 mg/l can inhibit the oxygen-carrying capacity of blood; this effect, known as "blue baby syndrome," can be fatal to infants. Bacteria can cause several waterborne diseases such as typhoid and gastroenteritis while the potential health effects of viruses from septic systems are unknown.

Disposal of industrial wastewater into open-bottomed drains or septic systems (also known as sumps, french drains, or seepage pits) is a major threat to Montana's groundwater. Organic solvents can be flushed into unconfined alluvial aquifers in urban areas via these drains that are also termed "injection wells" and regulated by federal law (see http://www.epa.gov/ogwdw/uic.html). PWS wells in Missoula and Bozeman have been abandoned after being contaminated with solvents. No studies have been conducted to find out how many private wells may also be contaminated. EPA estimates there are about 400 industrial injection wells and 200 automotive injection wells in Montana. More than 300 automotive injection wells have already been closed by converting the operation to a "dry shop" or connecting to a sanitary sewer. Municipal storm water sewers can contaminate groundwater if chemicals from numerous everyday spills are picked up in runoff. Comprehensive monitoring has not been conducted to determine how vulnerable groundwater in Montana is to contamination by storm water runoff, however.

The locations of 26,736 underground fuel storage tanks have been registered in Montana since tank registration began in the mid-1980s. Most of those tanks have been removed or permanently closed. In June 1998, there were 5,872 active tanks. There have been 3,295 confirmed leaks from underground tanks in Montana, 1,959 of which have undergone remediation. About half of the leaks reached groundwater. Five leaks resulted in contamination of PWS by benzene, a carcinogen.

Montana has eight sites listed on the federal Superfund National Priority List under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA); these sites are often referred to as CERCLA or Superfund sites. As of June 1998, 187 sites were prioritized for remedial action through CECRA, Montana’s superfund. Unlike CERCLA, CECRA also addresses sites that have asbestos or petroleum contamination. Ninety-four of the CECRA sites have documented impacts to groundwater.

In July 1996, through the reorganization of state government, groundwater sites that require long-term remediation but are not associated with permitting, underground storage tanks, or CECRA sites, were assigned to the Remediation Division in DEQ. In mid-1998 there were 84 groundwater remediation program sites. These sites include petroleum pipeline ruptures, spills associated with tanker truck wrecks, abandoned dumps, former dry cleaning facilities, transformer oil spills, and leaks from sewer lines. Approximately 79 of these sites are handled by the Ground Water Remediation Program of Hazardous Waste Site Cleanup Bureau. Five sites are being handled by the bureau's Petroleum Release Section.

Over 100 years of hard rock and coal mining in Montana has exposed large volumes of mine waste rock, spent ore, and mill tailings to weathering processes. Numerous streams are contaminated by water containing dissolved metals leached from these wastes or drained from mine adits. Groundwater in alluvial aquifers underlying many of these streams also is contaminated with metals. Releases of cyanide from active and abandoned mines have resulted from failure of impoundment liners, failure of heap leach pad liners, or through the failure of piping designed to transport process solution. Three releases resulted in the contamination of domestic water supplies.

An average of 300 accidental spills are reported each year to the Montana Hazardous Materials Emergency Response System. About 5 percent require extensive cleanup and monitoring. In 1995, a derailment in the Helena rail yard spilled 17,400 gallons of fuel oil. Monitoring confirmed that prompt removal of the contaminated soil prevented the contaminants from reaching groundwater.

Several pesticides have been detected in Montana groundwater: Aldicarb sulfoxide and aldicarb sulfone, Assert and its metabolite-imazamethabenz methyl, atrazine, bromacil, clopyralid, dicamba, dinoseb, diuron, imazapyr, MCPA, picloram, pentachlorophenol, prometon, simazine, and 2,4-D. Of those detected in PWS wells, all were below established health guidance levels except for pentachlorophenol and dinoseb. In three cases, pesticides have been detected in wells that supply water to rural schools. The Montana Agricultural Chemical Ground Water Protection Act directs the Montana Department of Agriculture (MDA) to develop a general management plan and specific management plans implementing BMPs where pesticides are detected in the groundwater. The statewide general pesticide management plan was completed in 1994. A specific management plan is currently being developed by MDA for Assert and its metabolite.

Twenty-five years ago the state had roughly 500 landfills and waste dumps, most of which have been closed. Those that have not been closed have been converted to container sites which are regulated by local government. In June 1998, there were 60 licensed Class II solid waste management facilities in Montana: 36 municipal/county landfills, 9 transfer stations, 10 soil treatment facilities, 1 incinerator, 1 infectious waste treatment facility, and 2 compost facilities. These facilities generally can except any solid waste that is not a regulated hazardous waste. Thirty-one active, and 10 inactive Class II solid waste management facilities currently monitor groundwater quality. There also are 62 Class III solid waste management facilities that can only except relatively inert wastes such as wood wastes and concrete that do not contain hazardous waste constituents.

The Montana Salinity Control Association estimates that saline seep has lowered the productivity of over 300,000 acres of agricultural land in Montana. Saline seep affects not only soil but also shallow groundwater and surface water. Saline seep occurs when water percolates beneath the root zone and becomes trapped by clay or shale layers. The water dissolves sodium, calcium, magnesium, sulfate, nitrate and occasionally selenium as it flows

through the soils. If the clay or shale layers intersect the surface of the ground, a seep forms and leaves white salts as the water evaporates. The conditions that can produce saline seep exist on over 17,000 square miles in Montana.

The Montana Agricultural Statistics Service estimates there were 2.7 million cattle in Montana in June 1998. Currently (September 1999), 61 concentrated animal feeding operations have discharge permits that allow a wastewater discharge only in case of an unusually large precipitation event.

Table 2 is a list of potential contaminant sources for Montana. The categories in this list were developed for the Texas Wellhead Protection Program. Sources were included on the basis of their relative threat to groundwater quality and a contaminant source evaluation and inventory done for the Missoula Wellhead Protection Area. See Appendix K for a more detailed list of contaminant sources.

Location of Potential Contaminant	**Specific Site Type**
Land Surface	Hazardous waste generation, storage and disposal Fertilizer and pesticide mixing and loading sites Irrigated lawns and crops Brine pits Land disposal of solid or liquid waste Illegal dumps Facilities using or storing chemicals Land farms for sludge, sewage, or soil contaminated by petroleum De-icing salt use or storage Animal feedlots Holding ponds and lagoons Accumulation of airborne particulates Mine tailings and waste rock Transportation routes, pipelines, terminals, and above-ground storage tanks
Soil Above the Water Table	Sumps and dry wells Gravel pits and construction excavations

	Storm water sumps and ponds Septic tanks, cesspools and privies Underground storage tanks and pipelines Sanitary landfills Cemeteries and animal burial sites Sewer lines and lift stations Artificial recharge projects
Below the Water Table	Injection wells Mine shafts Secondary recovery operations Application of chemicals with irrigation water (Chemigation wells) Drainage canals and saline seep wells Sites with groundwater permits Operating water wells and monitoring wells Abandoned oil and gas or water wells Producing geothermal or oil and gas wells Hydrological and mineral exploration boreholes Construction dewatering wells

Table 2. Potential sources of contamination of public water supplies.

4.2 Existing Information on Contaminant Sources

DEQ tracks spills that may contaminate groundwater and enters the information on a database. Databases also are maintained on groundwater, storm water, and surface water discharge permits. All establishments that annually use 20 gallons or more of halogenated solvents must register with DEQ (Title 75, Chapter 10, Part 451 MCA). To date, more than 200 businesses have registered. DEQ also has copies of the SARA Title III database for Montana. See http://www.nrc.uscg.mil/foia.html for federally managed data on reported spills.

Specific state programs, such as the Underground Storage Tank Program, Agricultural Chemicals in Ground water Program, and Hazardous Waste Program regulate specific categories of contaminants. Each agency implements its own inventory of sources. EPA provides access to source information in the Toxic Release Inventory, Resource Conservation and Recovery Act Information System, Permit Compliance System, and Superfund Database through the Envirofacts Internet site (http://www.epa.gov/enviro/). The available inventories will be combined and displayed by NRIS using a GIS mapping system to facilitate access and management. These databases will add to groundwater pollution data that is already available from NRIS. DEQ, DNRC, MDA, and local entities will supply the contaminant source information for the database.

Local fire chiefs inspect work places and may have information on the hazardous chemicals used and stored. The Employee and Community Hazardous Chemical Information Act (Title 50, Chapter 78, Part 301 et seq. MCA) requires each work place to inventory and properly label all hazardous chemicals.

Many federal land management agencies have inventoried hazards and prepared management plans that outline the activities occurring on public lands. When public lands are contained within the source water protection area, site specific information that may include GIS data is available from the appropriate land management agency.

4.3 Inventory Procedures

Inventories will target anthropogenic sources of potentially harmful contaminants within source water protection areas of community and non-community PWS. Sources of all primary drinking water contaminants and cryptosporidium will be considered, however, inventories will concentrate on significant potential sources of nitrate, microbial contaminants, volatile organic chemicals (VOCs), and synthetic organic chemicals (SOCs). Significant potential sources of metals identified in Appendix K will be targeted in inventories; these sources will primarily be active or abandoned mines and industrial facilities. Inventories for transient PWS will only address sources of contaminants with acute health effects (microbial contaminants and nitrate).

Nitrate and microbial contaminants typically originate from concentrated animal feeding operations, septic tanks, class V injection wells, municipal sanitary sewers, and wastewater treatment facilities. Nitrate also derives from fertilizer leached from cultivated cropland. VOCs consisting primarily of solvents and components of fuels originate from businesses where they are generated, stored or used. SOCs are primarily herbicides and pesticides; they may be used along major transportation routes and on cultivated cropland. Metals are most often found in water draining from abandoned mines, mine wastes or watersheds

containing mineralized rock formations. Metals also come from geothermal water that enters streams in Yellowstone Park in the headwaters of the Missouri River.

Businesses or activities considered significant potential contaminant sources are listed in Table 3 and described below. Electronic data from various resource agencies will be combined in a GIS system in order to complete inventories. Potential contaminant sources will be classified in contaminant inventories according to the 14 categories in Table 3. The level of information included for each source is determined by the availability of GIS coverages or other databases. PWS personnel, other local officials, and residents will be asked to add details that are not available in databases. A discussion of the nature and availability of data for each source category follows.

Source Category	Information
Septic Systems	Percent unsewered residential land use and population density
Animal Feeding Operations	Type, location, size, and history of releases
Underground Storage Tanks	Location, capacity, and compliance status
Underground Storage Tank Leaks	Location, length of plume, and remediation status
State and Federal Superfund Sites	Location, length of plume, and remediation status
RCRA Large Quantity Generators	Industry classification, location, and history of releases
Injection Wells	Class, standard industry classification, and location
Wastewater Treatment / Spray Irrigation / Lagoons	Location and permit requirements
Landfills	Location, operating status, and history of releases
Mines	Location and presence of mine wastes or drainage
MPDES Wastewater Discharges	Location and permit requirements
Municipal Sanitary Sewer	Location of sewer service areas and residential land use
Municipal Storm Sewers	Location of discharge and businesses in targeted standard industrial classifications
Storm Water Discharges	Location and permit requirements
Highways, Railroads, and Pipelines	Location and transportation analysis
Cultivated Cropland	Location and percent land use

Table 3. Source categories and information to be included in contaminant inventories.

Septic Systems -Septic system densities will be estimated from population density and the average number of persons per household. Actual septic system densities will be used if they are available.

Animal Feeding Operations - Locations of animal feeding operations will be obtained from the DEQ Permit Database. PWS Personnel, other local officials, and long-time residents will be relied on for additional information.

Underground Storage Tanks – Locations will be obtained from DEQ's database of underground storage tanks.).

Underground Storage Tank Leaks – DEQ database of underground storage tanks will be queried.

State and Federal Superfund Sites - Information will be obtained from the Comprehensive Environmental Response, Compensation, and Liability Information System using EPA's Envirofacts Query System (http://www.epa.gov/enviro/) and DEQ database of CECRA sites.

RCRA Large Quantity Generators - Information will be obtained from the Resource Conservation and Recovery Information System using EPA's Envirofacts Query System (http://www.epa.gov/enviro/).

Underground Injection Wells - Information on locations of Class II wells will come from the Montana State Board of Oil and Gas. Information on injection wells in classes I, III, IV, and V will come from EPA's Underground Injection Control Program. Information for Class V injection wells also will come from Internet yellow pages, PWS personnel or other local officials, or long-time residents. Businesses that generate, use, or store chemicals and are located in areas not served by sanitary sewer will be identified as possible locations of Class V wells. Equipment manufacturing and repair facilities, printing or photographic shops, dry cleaners, farm chemical suppliers, and wholesale fuel suppliers will be targeted by Standard Industrial Classification (SIC) code.

Wastewater Treatment / Spray Irrigation / Lagoons - Locations of facilities under this category will come from the DEQ permit database, PWS personnel, other local officials, and long-time residents.

Landfills – Locations of landfills will be obtained from NRIS (http://nris.state.mt.us/gis/datalist.html).

Mines - Locations of abandoned mines will be obtained from NRIS (http://nris.state.mt.us/gis/datalist.html). Locations of active mines will be obtained from the DEQ Industrial and Energy Minerals Bureau of the Permitting and Compliance Division.

MPDES Wastewater Discharges - Locations of MPDES permit holders will be obtained from EPA's Permit Compliance System database and DEQ files.

Municipal Sanitary Sewers – Locations of sanitary sewer service areas and sewer mains will be obtained from municipalities.

Municipal Stormwater Sewers – Locations of stormwater sewer discharges will be obtained from municipalities. A business phone directory will be queried to identify businesses that generate, use, or store chemicals in areas drained by stormwater sewers. Equipment

manufacturing and/or repair facilities, printing or photographic shops, dry cleaners, farm chemical suppliers, and wholesale fuel suppliers will be targeted by SIC code.

Storm Water Discharges - Discharges in this category are those that usually are not listed in the PCS database. DEQ=s Permit Database will be the primary source of information on these sources.

Highways, Railroads, and Oil and Gas Pipelines - Locations of highways and railroads will be obtained from maps or from 1:100,000 scale TIGER census data. Pipeline locations are available in GIS coverage from DEQ.

Cultivated Cropland - Agricultural land cultivated on a regular basis will be identified from data obtained from the U.S. Geological Survey (USGS) Geographic Information Retrieval and Analysis System.

Contaminant source inventories will be completed by DEQ, volunteers from the community, local government employees, and private consultants. Senior citizens are particularly valuable volunteers because they have observed the development of their communities over a number of years. Students in college business programs or service groups such as Scouts and 4H also are valuable volunteers. Another possibility would have the state set up community volunteer programs under state or other appropriate quality supervision that can accomplish lower-cost methods to locate potential sources of contamination. EPA recommends credible groups within each source water protection area do the inventories such as the elderly, through RSVP programs or younger people such as the Girl Scouts, Boy Scouts, or 4H club members. The Planning, Prevention and Assistance Division will facilitate by offering training for volunteers and local government employees in the contaminant source inventory process. See also the *Montana Source Water Protection Technical Guidance Manual* (MBMG, 1998). All known significant potential contaminant sources within source water protection areas will be accurately located on GIS base maps consisting of digital elevation models, line graphs, or similar base layers. Each base map will include an annotated street map and boundaries of source water protection areas. Significant potential contaminant sources will be identified by a number that links map locations to information contained on a contaminant inventory form (see Appendix F). Information on each source will include:

- A unique identification number, and all existing site or inventory numbers if site is regulated.
- Address, latitude/longitude, and township/range/section of the site
- Name, address and phone number of landowners
- Name, address and phone number of any renters or lease holders
- Type of activity of concern
- Chemicals used or stored, including Chemical Abstracts Service registry number where appropriate

The accuracy and completeness of the available data will be confirmed by local PWS personnel, sanitary surveyors, or parties contracted by DEQ to provide technical assistance to PWS. Once potential contaminant sources are located on the delineation base map the PWS operator will review it and recommend any needed additions, deletions, or corrections. Documentation will be required to support proposed changes. Confirmation of inventory results was addressed by the Montana Source Water Assessment Advisory Council and is implemented under their recommendation.

SECTION 5

5.0 Determination of Source Water Susceptibility

Determining source water susceptibility is the final mandatory component required by the SDWA and implemented through the Montana Source Water Protection Program. Montana adopts the definition of susceptibility stated by EPA (EPA 816-R-97-009) as Athe potential for a public water supply to draw water contaminated by inventoried sources at concentrations that would pose concern.@ The primary purpose for determining susceptibility is to prioritize potential contaminant sources for management actions by local entities. A secondary purpose is to prioritize PWS for source water protection efforts.

FACTORS THAT DETERMINE SUSCEPTIBILITY (EPA 816-R-97-009)

- The physical intergrity of the well/intake and the connection between the well/intake and the distribution system.
- The physical, chemical, geologic, hydrologic and biologic characteristics of the area over which, or through which the contaminants(s) will move.
- The nature and amount of contaminant(s) present at the well/take or in upgradient water.
- The nature and amount of contaminant(s) present in a source(s) and the likelihood of significant contaminant release from the source(s) based, in part, on the effectiveness of pollution-prevention measures at the sites of potential source(s) of contamination.

Susceptibility is evaluated in two separate analyses. First, intersystem susceptibility is based on source water sensitivity and known or potential exposure; this susceptibility ranking will be used by DEQ to prioritize PWS for grant funding. Source water sensitivity also will apply to EPA's forthcoming Ground Water Rule. Second, intrasystem susceptibility is based on the proximity or density of potential contaminant sources and whether barriers exist that may decrease the likelihood that contaminants will reach a water intake. Whether a contaminant is associated with acute or chronic health effects at concentrations expected to occur also is considered when assessing susceptibility. The results of intra-system susceptibility assessments are intended to facilitate protection actions and/or monitoring flexibility.

Results of intrasystem susceptibility analyses will be presented to PWS as a table listing all inventoried sources and their associated susceptibility rating along with a narrative describing the analysis. For more detail on reporting requirements for susceptibility analyses see the source water delineation and assessment report guidance in Appendix J.

5.1 Procedures for Determining Source Water Sensitivity and Intersystem Susceptibility

Intersystem susceptibility is determined by source sensitivity and exposure as indicated by documented water contamination (Table 4). Sensitivity is defined here as the relative ease with which contaminants can migrate to a source aquifer or surface water body. Sensitivities of common types of aquifers found in Montana are designated using the DRASTIC relative rating system (EPA/600/2-87/035). Surface water sources and sources classified as GWUDISW are classified as highly sensitive because of their high potential for microbial contamination.

Documented contamination is ranked according to violations of Maximum Contaminant Levels (MCLs) or significant detects during routine monitoring in the previous five years. Presence of fecal coliform, nitrate concentrations greater than 5 mg/L, any detects of VOCs or SOCs, and violations of MCLs for metals are

considered significant evidence of source water contamination. Documented exposure to contaminants regulated for their acute health effects (i.e. fecal coliform and nitrate) are given greater weight when determining intersystem susceptibility than those regulated for non-acute health risks (Table 4).

Source Water Sensitivity	Documented Exposure		
	Acute	**Non-acute**	**None**
High Source Water Sensitivity ▪ Surface water and GWUDISW ▪ Unconsolidated Alluvium (unconfined) ▪ Fluvial-Glacial Gravel ▪ Terrace and Pediment Gravel ▪ Shallow Fractured or Carbonate Bedrock	High Susceptibility	High Susceptibility	High Susceptibility
Moderate Source Water Sensitivity ▪ Semi-consolidated Valley Fill sediments ▪ Unconsolidated Alluvium (semi-confined)	High Susceptibility	Moderate Susceptibility	Moderate Susceptibility
Low Source Water Sensitivity ▪ Consolidated Sandstone Bedrock ▪ Deep Fractured or Carbonate Bedrock	High Susceptibility	Moderate Susceptibility	Low Susceptibility

Table 4. Inter-system susceptibility of public water systems to potential sources of contamination. Based on source water sensitivity and documented exposure.

5.2 Procedures for Determining Intrasystem Susceptibility

Intrasystem susceptibility is determined by the hazard associated with potential contaminant sources and the existence of barriers that may decrease the likelihood that contaminated water will flow to a PWS well or intake (Table 5). Proximity or density of significant potential contaminant sources and nature of contaminants determines hazard (Table 6). Barriers can be natural conditions, engineered structures, or management actions. Susceptibility ratings will be determined individually for point sources and collectively for non-point sources. Reports to PWS will include a table listing all significant potential contaminant sources identified in the inventory and their associated hazard and relative susceptibility ratings. A narrative describing the presence of barriers for each source will accompany a table showing hazard and susceptibility.

Presence of Barriers	Hazard		
	High	**Moderate**	**Low**
No Barriers	Very High Susceptibility	High Susceptibility	Moderate Susceptibility
One Barrier	High Susceptibility	Moderate Susceptibility	Low Susceptibility

Multiple Barriers	Moderate Susceptibility	Low Susceptibility	Very Low Susceptibility

Table 5. Relative susceptibility of a PWS to specific contaminant sources as determined by hazard (see Table 6) and the presence of barriers.

5.2.1 Basis for Determining Hazard

Hazard ratings for point source contaminants listed in Table 3 that are within inventory regions of wells will depend on whether the source aquifer is unconfined or confined. For PWS wells in unconfined aquifers, hazard for point source contaminants will be determined by groundwater TOT regardless of contaminant. For PWS wells in confined aquifers, hazard for point source contaminants will depend on whether wells within the inventory region are effectively sealed through the confining layer. Hazard for point source contaminants in spill response regions will depend on whether contaminants of concern are likely to discharge directly to the source water. An additional consideration for surface water sources is whether contaminants are associated with acute health affects at concentrations likely to occur. Nitrate and microbial contaminants are considered to have acute health affects for the purpose of hazard determination. Nitrate and microbial contaminants can come from concentrated animal feeding operations, septic tanks, municipal sanitary sewers, and wastewater treatment facilities. Nitrate also can derive from fertilizer leached from cultivated cropland. Hazard for point source contaminants within a 3-year ZOC of a well that is hydraulically connected to a surface water source will be determined in the same way as for point source contaminants near wells. Similarly, hazard determination for a point contaminant source within a 3-year ZOC of a source classified as GWUDISW will be required to meet the criteria established for wells. Hazard for point source contaminants in buffers around surface waters that are hydraulically connected to wells or sources classified as GWUDISW will be determined the same as contaminant sources in spill response regions.

Hazard of cropped agricultural land for both groundwater and surface water sources will be based on percent land use. Cropped agricultural land includes dryland as well as irrigated crops but does not include natural hay where cultivation or chemical application is not practiced. Figure 8 shows the distribution of cropped agricultural land across Montana. Percent cropped agricultural land in an inventory or spill response region will be determined from data obtained from the USGS Geographic Information Retrieval and Analysis System. USGS digitized the data from 1:250,000 scale maps, which it created through field surveys and aerial photo interpretation.

Hazard of municipal sanitary sewers for both groundwater and surface water sources will be based on percent of land in an inventory or spill response region that is sewered residential. Percent sewered residential will be determined from land use data obtained from the USGS Geographic Information Retrieval and Analysis System and boundaries of sewer coverage obtained from municipalities.

5.2.2 Basis for Identifying Barriers

As mentioned previously, barriers can be natural conditions, engineered structures, or management actions. Credible evidence showing that a barrier meets minimum criteria will be required by DEQ before it is considered in a susceptibility assessment (See Appendix J for criteria used to evaluate the effectiveness of barriers).

Natural Barriers – A continuous clay layer, a deep water table, contaminant attenuation capacity of vadose zone and aquifer materials, and dilution are considered natural barriers for groundwater sources. Natural barriers considered for surface water sources include dilution, high soil permeability, low land surface slope, and a forested riparian zone.

	Type of Contaminant Source	High Hazard	Moderate Hazard	Low Hazard
SURFACE WATER	Point Sources of Nitrate or Microbes	Potential for direct discharge to source water	Potential for discharge to groundwater hydraulically connected to source water	Potential contaminant sources in the watershed region
	Point Sources of VOCs, SOCs, or Metals	Potential for direct discharge of large quantities from roads, rails, or pipelines	Potential for direct discharge of small quantities to source water	Potential for discharge to groundwater hydraulically connected to source water
WELLS	**Point Sources of All Contaminants** (Unconfined)	Within 1-year TOT	1 to 3 years TOT	Over 3 years TOT
	Point Sources of All Contaminants (Confined)	PWS well is not sealed through the confining layer	Well(s) in the inventory region other than the PWS well are not sealed through the confining layer	All wells in the inventory region are sealed through the confining layer
ALL	**Septic Systems**	More than 300 per sq. mi.	50 – 300 per sq. mi.	Less than 50 per sq. mi.
	Municipal Sanitary Sewer (% land use)	More than 50 percent of region	20 to 50 percent of region	Less than 20 percent of region
	Cropped Agricultural Land	More than 50 percent of region	20 to 50 percent	Less than 20 percent of region

	(% land use)		of region	

Table 6. Hazard of potential contaminant sources associated with proximity to a PWS well or intake or density within a PWS inventory or spill response region.

Engineered Barriers – Engineered barriers provide physical containment or early detection of potential contaminants. Double walled underground storage tanks, spill catchment basins, and monitoring wells installed for leak detection are examples of engineered barriers. PWS wells that meet state construction standards are considered engineered barriers to contamination in control zones to the extent that a secure intake prevents contamination through inter-aquifer leakage. Depth of a well intake below the water table also is an engineered barrier. Surface water intakes will usually be considered inherently vulnerable, although intake location may be considered protective under certain circumstances.

Management Actions – Management plans can be barriers if they are implemented through formal actions that prohibit or control potentially polluting activities. Emergency response planning can be considered a barrier if prohibition or control is not feasible, as in the case of a stream crossing by rail or road. Growth management plans that control development in unsewered areas can be barriers. Best management practices for farming or logging operations also can be barriers.

Contaminant source inventories will be updated annually and submitted to DEQ every 5 years.

SECTION 6

6.0 Source Water Protection Area Management

The ultimate goal of SWPP is to protect and benefit PWS. The mechanism under SWPP that will provide the greatest protection and benefit is the source water protection plan. Source water protection plans describe actions that when taken will reduce the susceptibility of a PWS to contamination. PWS in Montana are not required to develop source water protection plans, however, DEQ can provide technical assistance and limited financial assistance to PWS choosing to develop and carry out a plan. Although help from DEQ is available, local effort and initiative are key to developing useful plans.

A source water protection plan should focus on significant potential contaminant sources that have the highest susceptibility rank. Effective plans consider local hydrological or hydrogeological conditions, land uses, and political and economic considerations. Source water protection plans can be implemented through existing local, state, and federal environmental programs, such as permitting, inspections, and enforcement or through new initiatives.

Developing a source water protection plan is a six-step process. The steps are: 1) getting organized, 2) delineating the land area to be protected, 3) identifying potential contaminant sources, 4) developing a management plan, 5) planning for the future through emergency plan preparation, and 6) DEQ review and certification of the plan.

6.1 Options for Managing Source Water Protection Areas

The best management strategy for a local entity will depend on the nature of the source water, the size of the source water protection area, and the characteristics of potential contaminant sources. Selection of a management strategy also may depend on whether a local entity has legislative or governing powers. In all cases however, DEQ will encourage practical approaches and emphasize that effective management usually does not require new regulations.

All facilities, activities, or land uses where there is a contaminant that may be released to a drinking water source in quantities sufficient to threaten human health will be considered potential contaminant sources. These facilities, activities, or land uses will be targeted for management according to the results of the susceptibility assessment. Table 7 lists available management methods for each source water protection region listed in order of preference and Appendix C lists existing statutes that regulate pollution sources. (See Figures 5 and 6 for the locations of each region inside a source water protection area.)

The authority of local governments to regulate activities detrimental to PWS or to engage in activities that protect the PWS is described, in part, in Table 8.

Sheridan and Missoula provide examples of management approaches. The town of Sheridan developed an ordinance to use permits to oversee potential sources of contaminants. Sheridan used the existing city structure and state regulations to implement the ordinance. Missoula developed a city ordinance to prohibit or regulate hazardous and toxic substances within its source water protection areas. The ordinance is administered by the Missoula City/County Health Department through a Local Water Quality District.

Alternative Management Methods in Order of Preference for Each Region		
In the **Control zone** the best options are **999999**	In the **Inventory or Spill Response Region** the best options are **999999**	In the **Recharge or Watershed Region** the best options are **999999**
1. Direct Ownership 2. Restrictive Easements 3. Source Prohibitions 4. Long-term Lease 5. Municipal Ordinance	1. Source Permits 2. Source Operating and Design Standards 3. Best Management Practices 4. Source Inspections 5. Education 6. Municipal Ordinances	1. Best Management Practices 2. Surface Water Monitoring 3. Operating and Design Standard 4. Site Plan Review 5. Cooperative Agreements 6. Education

Table 7. Methods available to local communities to manage source water protection areas.

Montana Code	Authority Granted
7-1-4123 MCA	A municipality has the legislative power to adopt ordinances or resolutions to secure and promote the general public health and welfare.
7-4-4306 MCA	The mayor may exercise such power vested by ordinance to enforce public health ordinances and regulations in all places within 5 miles of the city limits.
7-13-2218 MCA	Any county water district may lease or purchase water, land, or rights necessary for pollution abatement and may commence proceedings to prevent interference with groundwater within the district.
7-13-4402 MCA	The city or town has the power to carry out means for securing a supply of water.
7-13-4406 MCA	Cities and towns can enact and enforce sanitary ordinances to abate nuisances and preserve the purity of their water supplies.
7-21-4204 MCA	The city or town has the power, within the city or within 3 miles to regulate any offensive and unwholesome establishments.
7-33-4205 MCA	The city or town has the power to regulate and prevent the storage of kerosene, oils, and inflammable materials within 3 miles of the city limits.
75-6-120 MCA	The governing body of the county in which a certified source water protection area exists may regulate conditions that threaten water quality within the WHPA.
85-2-506 MCA	DNRC may restrict groundwater withdrawals in a designated area by a petition of a state or local public health agency for identified public health threats.
50-78-301 MCA	Local fire chiefs may make onsite inspections of hazardous chemicals in the work place and report violations to the county attorney or law enforcement.
7-11-101 to 230, MCA	Local entities that share an aquifer, drainage, or area may establish and cooperatively manage a joint source water protection area through an interlocal agreement.

Table 8. Authority of Local Government

Examples of local ordinances can be provided by DEQ. A *Compendium of Local Source water Protection Ordinance* also can be made available. For a complete discussion of management options available for source water protection in Montana see *The Montana Source Water Protection Technical Guidance Manual* (MBMG 1998).

6.2 Education Assistance Programs

Education and information is the most visible assistance activity of the Montana Source Water Protection Program (see Appendix E for the Public Awareness and Education Action Plan). DEQ, in conjunction with Montana Environmental Training Center and Montana Rural Water, provides training in water quality issues and management of contamination sources. Classes are held around the state and provide continuing education credits for re-certification of water and wastewater plant operators. Each year, DEQ holds two 1-week Water Schools. Source water protection is included as a half-day session in classes sponsored by the Montana Environmental Training Center and the Water School.

The Source Water Protection Section of DEQ joins with other state agencies, local groups and businesses in promoting waste reduction and pollution prevention programs as outlined in the Montana Integrated Waste Management Act (Title 75, Chapter 10, Part 801 to 807 MCA) and advocated by the Pollution Prevention Bureau of DEQ. Montana State University Extension Service has several programs addressing pollution prevention. MSU=s Montana Pollution Prevention Program provides education, training, and technical assistance for small businesses. Additional programs are FarmAsyst, which addresses protection of private wells, and the Urban Pest Management Program, which addresses residential use of pesticides. Local weed control boards participate in weed control efforts whose success may be dependent on the use of certain chemicals and physical control methods; these are useful tools selective use of which may decrease the need for them in the future.

EPA has a training module, called the Source Water Protection Implementation Training Module, which covers all aspects of source water protection, and DEQ has a portable display on the source water protection program. Each will be used at meetings and other gatherings to publicize source water protection (see Table 8 for groups with annual meetings or newsletters where source water protection can be publicized).

6.3 Links to Existing Water Quality Protection Program

The source water protection program is connected to many other water quality protection activities in Montana. The most apparent and direct connections are through the DEQ. The chart entitled ***Montana Ground Water Protection Related Programs, Activities, Legislations, and Implementing Agencies*** in Appendix C describes DEQ programs with links to source water protection. How these links to other programs occur are described as *Roles and Duties* in Section 2.0 of this document. Source Water Protection Section personnel are participating on the agency's Watershed Management Core Team; an internal process intended to identify and develop an intra-agency watershed management approach. The Source Water Protection Section at DEQ coordinates DEQ's role in the Montana Ground Water Plan (a section of the Montana Water Plan). The coordinating role ensures that public drinking water sources are considered in the statewide water planning process.

6.4 Identification of Uncontrolled Sources and Strategies for Their Reduction

Procedures are available to pursue new statutes if they are necessary to address potential uncontrolled contaminant sources. In Montana, water issues are identified and prioritized for legislative action every two years by revising the State Water Plan. The Groundwater Quality/Quantity Management Steering Committee coordinated by DNRC assists in developing and revising the State Water Plan by building a consensus on solutions

to water problems through public participation. The final recommendations that go to the Legislature are usually adopted and implemented.

County Disaster and Emergency Coordinators	County Extension Service
Economic Development Councils	Local Development Corporations
City and County Planning Boards	Waste Water Treatment Operators
Water Supply Operators	County Weed Boards
Alliance for Public Policy	Alternative Energy Resource Organization
Clark Fork Coalition	Community Resource Center
Flathead Resources Organization	Greater Yellowstone Coalition
Property Owners Associations	League of Women Voters
Montana Association of Conservation Districts	Montana Association of Counties
Montana Association of Realtors	Montana Audubon Society
Montana Wilderness Association	Montana Chamber of Commerce
Montana Municipal Insurance Authority	Montana Rural Water Systems, Inc.
Montana Taxpayers Association	Montana Salinity Control Association
Montana Solid Waste Contractors	Montana Senior Citizens Association
Montana Environmental Information Center	Montana League of Cities and Towns
Montana Environmental Health Association	Montana Public Health Association
Montana Community Finance Corporation	Montana Water Course
Montana Education Association	Montana Section AWWA
Montana Water Resources Association	Northern Plains Resource Council
Old West Regional Commission	Project Wet
Retired Senior Volunteer Program	Montana Association of Planners
Rocky Mountain Developmental Council	Voluntary Action Center
Western Environmental Trade Association	Senior Citizen Project Fund
Women Involved in Farm Economics	Big Sky Council
Community Action Association	Junior Chamber of Commerce
Local Government Center	Western Planner, Inc.
Montana Environmental Education Association	Montana Water Resources Office at MSU
Montana Local Government Office at MSU	

Table 9. Groups with annual meetings or newsletters where source water protection can be publicized.

Several recommendations important to source water protection were made in the 1992 State Water Plan. These included developing BMPs through the Nonpoint Source Pollution Control Program, creating controlled groundwater areas when water quality is threatened, developing a comprehensive groundwater plan, establishing a hole-plugging program for abandoned oil and gas wells, and expanding water-related information and education programs. DNRC recently completed the Montana Ground Water Plan based on significant input from DEQ, other resource management agencies and the public. The plan will be submitted to the 1999 Montana Legislature and generally forms the basis of the Montana Comprehensive Ground Water Plan.

SECTION 7

7.0 Development of Emergency Plans

Emergency planning is a crucial part of effective source water protection and as such must be included in a source water protection plan before it will be certified by DEQ. Emergency plans describe how local entities and PWS will respond to emergencies, such as natural disasters and accidental contaminant spills that threaten water supplies. These requirements are made to ensure that PWS are prepared to deal with unexpected events and provide alternative drinking water supplies.

7.1 Existing Emergency Response Plans

The Department of Military Affairs, Disaster and Emergency Services Division, and DEQ coordinate federal, state, and local services during emergencies (Title 10, Chapter 3, Part 101 et seq. MCA). Local disaster and emergency services operate on the county level. State and local emergency organizations promote disaster prevention, planning, training, public education, and development of a comprehensive disaster and emergency plan. They also maintain a listing of industries, resources, and facilities within their area.

The Montana Hazardous Materials Response Plan covers four phases: pre-disaster, disaster, recovery, and hazard mitigation. The pre-disaster phase includes plans for public warning and information, communication, coordination of emergency services, and evacuation. The disaster phase includes plans for search and rescue, health and medical services, law enforcement, transportation, fire suppression, and military support. The recovery phase includes plans for establishing disaster field offices, state disaster assistance programs, damage assessment and damage survey, social services, housing and shelter, debris removal, crisis counseling, coordinating private and voluntary relief organizations, and mortuary services. The hazard mitigation phase includes protection against discrimination, disaster assistance, repair and restoration, debris removal, temporary housing, unemployment assistance, individual and family grant programs, food and commodities distribution, legal services, crisis counseling, community disaster loans, temporary communications and public transportation, fire suppression, timber removal, and federal assistance.

Technical assistance staff from DEQ's Public Water Supply Program is responsible for the Montana Emergency Drinking Water Plan. The plan addresses: objectives, relationship of the plan to existing emergency services plans, support resources, emergency response, communication, alternative water supplies, remediation, emergency source development, and review and update procedures.

7.2 Coordination Mechanisms

The Department of Military Affairs, DEQ, Department of Transportation, MDA, Department of Justice, and Fish, Wildlife and Parks coordinate with federal, state, local, and Canadian disaster and emergency services. The Montana Hazardous Materials Response Plan meets the requirements of the Superfund Amendments and Reauthorization Act, Title III for contingency planning. Montana published the *Local Government Disaster Information Manual* to outline funding procedures for emergencies.

The state uses an AIncident Command" procedure to coordinate activities of local disaster and emergency services when emergencies involve different jurisdictions or when backup help is required. Local, state, and federal personnel are trained to join or withdraw from the incident command structure to effectively respond to developing emergencies. This process enhances efficient use of personnel and equipment. Emergency chlorination and filtration units, bottled water, water tanker trucks, portable chemical toilets, and portable showers are equipment and supplies specific to water supply emergencies.

Several laws have been enacted to facilitate coordination of emergency operations. They are: the Uniform Transboundary Pollution Reciprocal Access Act (Title 75, Chapter 16, Part 101-109 MCA); the Interstate Mutual Aid Act, (Title 10, Chapter 3, Part 207 MCA); and Northwest Interstate Compact on Low Level Radioactive Waste Management (Title 75, Chapter 3, Part 501 MCA).

7.3 Short-term Emergency Response

DEQ and the Department of Military Affairs maintain a Hazardous Materials Emergency Response System. The system is staffed 24 hours a day and the phone number is (406) 444-6911. All spills or releases of hazardous materials or other wastes that pollute or threaten to pollute state waters must be reported, contained, removed, and disposed of, regardless of size. State waters are bodies of water, irrigation systems, or drainage systems, either surface or underground.

DEQ responds immediately to large spills of soluble toxic materials near PWS intakes. Appropriate state agencies are notified, local health officials or police are asked to investigate, and a DEQ investigator is sent to the site. The responsible party is financially liable for cleanup, providing alternative sources of drinking water, and monitoring for groundwater contamination as specified in ARM (16.20.1025).

7.4 Long-term Response

Long-term response usually involves testing water from the PWS, rationing uncontaminated water supplies, boiling water or using filtering devices, disinfecting the water system or cleaning-up in other appropriate ways, and providing a community with potable water if its water supply cannot be effectively decontaminated. If new water supply wells are required, the wells are designed and constructed according to the regulations discussed in the Chapter 8 of this document.

Long-term response includes monitoring to determine if residual contaminants exist and if they are reaching water supplies. If contamination is found, treatment facilities are installed to return the water to nondegradation standards. Remediation and monitoring plans are submitted to DEQ for approval, and monitoring data are submitted on a regular basis. Again, the responsible party is liable for cleanup, providing alternative sources of drinking water, and monitoring for groundwater contamination as specified in ARM 16.20.1025. The responsible party is responsible for monitoring disposal sites such as land farm sites for petroleum products if they are not part of a licensed facility.

PWS are responsible for providing safe drinking water if drinking water standards are exceeded because of natural conditions or if a responsible party cannot be identified. Extensive contamination of sites without identified responsible parties can be cleaned up under the authority of DEQ, CECRA, or other state or federal programs.

State emergency funds designated for supplying alternative sources of water may be available through the Environmental Contingency Account (Title 75, Chapter 1, Part 1101 MCA) when a state of emergency has been declared. If an emergency has not been declared, funds can be sought from the Environmental Quality Protection Fund (Title 75, Chapter 10, Part 704 MCA). Infrastructure development loans are available if a new well is needed.

7.5 Emergency Planning for Source Water Protection Areas

PWS will be required to describe procedures to be followed to correct problems with their distribution systems, wells, or surface water intake. The plan should include the following:

- Designation of an emergency coordinator for the PWS.
- Procedures to shut down and isolate threatened or contaminated intakes from the distribution system.
- Details on alternate sources of water for drinking and other household uses that will be available in case of emergency as well as details on sources of equipment to transport, disinfect, and distribute the water.
    - Procedures to decontaminate the distribution system and intake.
    - Procedures to coordinate with county and state emergency response agencies.
- Procedures to effectively communicate details of emergencies and recommended precautions to water users.
    - Alternatives for a new permanent water supply if the present one must be abandoned.
    - Sources of emergency funds and procedures for requesting and disbursing such funds.

SECTION 8

8.0 Requirements for New Public Water Supply Wells or Intakes

Previous sections of SWPP focus on protection of existing wells or surface water intakes. New wells or intakes can be protected using the same methods. DEQ has specific regulations that require an evaluation of the suitability of a new source with respect to quantity, ambient quality, and susceptibility to contamination. DNRC has requirements regarding application for water rights and reservation of future water rights for PWS.

8.1 DEQ Requirements for New Water Sources

Construction standards for new PWS wells are described in DEQ Circulars WQB #1 for large PWS and WQB #3 for small PWS. The standards require submission of plans and specifications to DEQ prior to construction. Additionally, all wells must meet the minimum construction standards described in the Board of Water Well Contractors rules (ARM 36.21.601 et seq.).

Standards for locating and constructing new PWS surface water intakes are described in DEQ Circular WQB #1. A sanitary survey is required to determine future uses of reservoirs, the degree of control the PWS has over activities in the watershed, the susceptibility to accidental spills, the chemical characteristics of the water, the suitability of the proposed

treatment process, and the effects of currents, wind and ice. Requirements for intake structures relate to placement depth, flushing provisions, and protection against damage or drawing in debris. Extreme conditions such as low or high flow and ice damming and impacts from upstream tributaries must be considered.

PWS are responsible for completing source water delineation and assessments for all proposed new water sources and submitting the results with plans and specifications to DEQ prior to construction. Minimum requirements for delineation and assessment reports for new sources are in DEQ Circular PWS-6. Source water protection areas must be delineated and a map showing locations of potential contaminant sources must be included. Information sufficient to assess the susceptibility of proposed new water sources to significant potential contaminant sources is required. PWS are not eligible for funds from DEQ to pay for delineation and assessments for new sources.

8.2 DNRC Requirements for New Wells

DNRC manages water rights in Montana. The owner of any new well intended to yield more than 35 gallons per minute (gpm) must obtain a Beneficial Water Use Permit from DNRC prior to drilling. Six conditions must be met before a permit is issued:

- Unappropriated water is available.
- No other water rights will be adversely affected.
- The proposed well construction and operation meet state requirements.
- The water is put to beneficial use.
- The proposed use will not adversely affect the water quality required for other beneficial uses by water right holders.
- The well owner owns the land where the well will be drilled, or has the permission of the landowner to construct the well.

Water users completing wells intended to use less than 35 gpm must file a Notice of Completion of Groundwater Development with DNRC within 60 days of completion.

If a community needs to ensure the future availability of water but is not actively pursuing well development, it can apply to DNRC for a water reservation. This can allow a PWS to anticipate and plan for growth by reserving unappropriated water for future use based on projected needs.

SECTION 9

9.0 Public Participation

A highlight of Montana government is the emphasis placed on public participation in decision-making. The Aright to expect government agencies to afford such opportunity for citizen participation in the operation of the agencies prior to a final decision" is established in Montana's Constitution (Article II, Section 8) and implemented by law. The Public Participation Law (Title 2, Chapter 3, Part 101-114 MCA) governs the activities of state agencies and provides that agency decisions may be set aside by a district court if any person's rights are prejudiced.

Comments from the Wellhead Protection Advisory Committee and the Source Water Assessment Program Advisory Council were invaluable when developing the Source Water Assessment Program. A program of enhanced public participation was implemented to maximize public participation opportunities; the program consisted of an Internet suggestion box and a survey mailed to teachers at schools with their own PWS.

9.1 Wellhead Protection Advisory Committee

The Montana Wellhead Protection Program was established followed procedures established in 40 CFR Part 25--Public Participation under the Safe Drinking Water Act. This regulation describes procedures for coordinating public hearings, public meetings, and advisory groups. The Responsiveness Survey required by *EPA Guidance for Applicants for State Wellhead Protection Program Assistance Funds Under the Safe Drinking Water Act* is attached in Appendix A.

On August 13, 1991, the Director of DEQ (at that time the environmental programs of the former Department of Health and Environmental Sciences) appointed a Wellhead Protection Advisory Committee to recommend a program for Montana pursuant to the 1986 amendments to the SDWA. Committee members met the following criteria:

- They were interested in protecting Montana's groundwater resources.
- They were available to meet quarterly for one day at a central location.
- They had experience dealing with issues regarding natural resources or groundwater protection.

- They represented a unique area or community where groundwater was used by a PWS.

- They were associated with one of the following: state legislature, local government, county sanitation department, PWS, health provider, planning board, small business, agriculture, school system, environmental protection group, or state agency dealing with groundwater.

The role of the Advisory Committee was to oversee the creation and implementation of Montana's

Wellhead Protection Program. The committee was given the following tasks:

- Consider the various ways a wellhead protection program can operate and recommend the best option for Montana.

- Outline a plan of action to implement a statewide wellhead protection program.

- Develop criteria to prioritize PWS for developing wellhead protection areas.

- Suggest ways to enhance public support for wellhead protection areas.

- Advise the Wellhead Protection Coordinator on potential problems and suggest appropriate solutions.

The committee meetings were open to the public and many citizens attended. Several general media press releases described the events associated with establishing the Montana Wellhead Protection Program. A newsletter called the *Ground water Column* was published and distributed quarterly. A mailing list containing the names of over 300 individuals and organizations was established. Information from DEQ and the Wellhead Protection Advisory Committee was sent to those on the mailing list at each stage during development of the Montana Wellhead Protection Program (WHPP).

Wellhead Protection Advisory Committee		
Carolyn Colman	Mayor	West Yellowstone
Valerie J. Counts	Park County Planning Director	Livingston
Diana C. Day	Small Business Owner	Harlowtown
Ethel Harding	State Senator	Polson
Vern K. Heisler	DEQ	Billings
Arvid M. Hiller	Mountain Water Company	Missoula
Ed Hillman	ESD Inc. (Well Drilling)	Livingston
Debi Madison	Ft. Peck Tribal Office	Poplar
Lyle Quick	Northern Plains Resource Council	Circle
Sam Rodriguez	DNRC Regional Office	Lewistown
Gerald Smith	Rancher & PWS Operator	Galata
Ward Swanser	Attorney	Billings
Melissa Tuemmler	City/County Health Department	Great Falls
Wayne Van Voast	Bureau of Mines and Geology	Butte

A summary of the draft WHPP was sent to everyone on the mailing list and to every community and nontransient noncommunity PWS. A complete copy of the draft Montana Wellhead Protection Program was sent to every public library, university and college library in the state. Eight public meetings were held around the state and a public hearing was held in Helena. Comments were requested, and many people responded with ideas that were incorporated into the policy direction of the advisory committee and final draft of WHPP.

EPA approved WHPP in 1994.

9.2 Source Water Assessment Program Advisory Council

The Montana Source Water Assessment Program Advisory Council (SWAPAC) was appointed by the Director of DEQ on May 20, 1998 pursuant to the requirements of the 1996 amendments to the SDWA. Interested citizens and groups as described in EPA's Final Guidance were solicited to participate on the advisory council to ensure the broadest public participation. The core of the SWAPAC consists of members of the Water Pollution Control Advisory Council. The Water Pollution Control Advisory Council is a statutory council that represents a broad range of business and industry interests, conservation groups, and public interests in Montana. Additional members were solicited to join the core group to ensure representation by public health groups, groups representing vulnerable populations, tribes, water system operators, and others. The two councils were combined because of the extensive public participation process used to develop the Montana Wellhead Protection Program and because Montana's Source Water Protection Program is based on the EPA

approved wellhead protection document. Meetings of the Source Water Protection Advisory Council were open to the public and their times posted on the DEQ homepage.

In order to best use the experience of the council members, a survey was conducted to identify specific areas of interest they might have that would be most relevant to key issue topics (public participation, delineation, pass-through grant option, inventory, susceptibility, coordination, making results available). The survey was intended to allow council members to identify topic areas in which they have an important interest or valuable experience. Survey results allowed DEQ to form an ad hoc technical work group to address technical issues. This approach allowed council members to comment on those issues in which they were most interested while limiting unnecessary time spent traveling and participating in meetings.

SOURCE WATER ASSESSMENT PROGRAM ADVISORY COUNCIL		
George Algard	Montana Dept of Ag	Helena
Mike Cobb	Agriculture-Rancher	Augusta
Roger DeBruyker	Montana Legislature	Floweree
Denise Deluca	Environmental Consultant	Missoula
Bruce Farling	Trout Unlimited	Missoula
Pat Graham	Montana Fish, Wildlife and Parks	Helena
Debi Madison	Ft. Peck Tribal Office	Poplar
Mary Miller	Montana Bureau of Mines and Geology	Butte
Shelly Nolan	PWS Operator	Havre
Bill O'Connell	Montana Rural Water Systems	Butte
Doug Parker	Mining Industry	Missoula
Richard Parks	Parks' Fly Shop	Gardiner
Joe Steiner	City of Billings	Billings
Jack Stults	Montana DNRC	Helena
Starr Sullivan	Water Env. Fed, Pro. Wastewater Op. Div	Missoula
Robert Willems	Montana Association of Conservation Districts	Harlowton

9.2.1 Solicitation for Participation on the Source Water Assessment Program Advisory Council

Montana began to consider soliciting representatives to participate on SWAPAC upon issuance of EPA's final guidance in August 1997. Initially, 59 individuals or groups were identified as potential advisory council members based on EPA's final guidance. An informational package was mailed to these individuals or groups to gauge interest. Based on response the list was shortened to 26 including those who responded to the initial mailing. This list was compared with the recommendations in

EPA's final guidance and further pared to include those respondents that fit EPA's criteria best. Those on the list were contacted by phone to confirm their level of interest and ensure their availability. This short list was presented to the DEQ director for appointment to the SWAPAC.

Many of those potential SWAPAC members initially contacted indicated an interest in following the progress of the program but could not commit to participate on an advisory council for various reasons. The most common reason cited for non-participation was the degree of commitment required (travel over significant distances for half-day meetings) and lack of apparent direct or significant impact to the issues of the individual or group contacted. As a result, DEQ developed a quarterly SWAP newsletter and maintains an extensive mailing list to ensure the program is put before individuals or groups known to have interest in program issues. Additionally, the newsletter is posted on the Montana SWPP Internet site along with all other SWPP documents.

Formal groups representing statewide “at-risk” populations such as the elderly, children, or the immunocompromised are generally not available in Montana. Therefore, DEQ met with the state public health agency on April 15, 1998 in order to discuss how best to address their representation on the SWAP council. As a result, a solicitation to participate on the advisory council was issued to the Montana Public Health Association, the Montana Environmental Health Association, the manager of the Senior/Long Term Care program at the Department of Public Health and Human Services, and the Flathead Aids Council. These groups come closest to representing the elderly, children, and the immunocompromised in Montana. None of the above listed groups elected to participate on the council. As noted above, DEQ developed a quarterly newsletter describing the status of the SWAP program as it developed and included these groups on the direct mailing list. This provided an additional opportunity for participation by these groups at any time.

DEQ contacted EPA's tribal liaison at the Montana office because of concern about the lack of tribal participation in SWAPAC despite a formal invitation to do so. The concern originated because only the Fort Peck Tribes are represented. Montana was advised that the initial solicitation to tribes to participate on the SWAPAC, and updating via the quarterly newsletter, constitute adequate effort. EPA's tribal liaison also pointed out that representation by the Fort Peck Tribes was significant since they participate in the statewide tribal organization and will alert other tribes to significant SWPP issues.

DEQ was successful in gaining the participation of a State Drinking Water Revolving Fund Advisory Committee member on the SWAP Advisory Council in an effort to ensure continuity and the exchange of information between the two advisory groups (see also Section 10.1).

9.2.2 Key Issues Considered by SWAPAC

SWAPAC was asked to provide input on key issues identified by EPA. Comments were obtained through formal meetings of the complete council and through requests to specific council members by electronic and conventional mail and by phone. The general council responded to implementation issues while the ad hoc technical committee responded to issues relating to the delineation and assessment approaches. Comments on key issues by SWAPAC and responses by DEQ can be found in the meeting minutes and additional records contained in Appendix B.

9.3 Enhanced Public Participation

The Montana Water Center at Montana State University implemented an enhanced public participation campaign to maximize opportunities for public participation. Enhancement of public participation was achieved by notifying the public of the four public meetings that were conducted to obtain comment on SWPP, sponsorship of an Internet suggestion box on the Montana Source Water Protection Internet page, and a survey mailed to schools that have PWS. See Appendix A for a listing of comments received through the Internet site.

DEQ mailed a quarterly newsletter to people that represent a broad spectrum of public and business interests. This newsletter provided a forum for comment on Montana's approach to source water assessment during development of this document and will provide a forum for public comment throughout implementation of SWPP.

9.4 Public Meetings

DEQ conducted public meetings statewide to provide opportunity for general public involvement. The meeting schedule was as follows:

November 12, 1998	Kalispell Wastewater Treatment Plant	2001 Airport Rd Kalispell
November 16, 1998	Billings Hotel and Convention Center	1223 Mullowney Rd Billings
November 17, 1998	Wolf Point Sherman Motor Inn	200 E. Main Wolf Point
November 18, 1998	Great Falls Campus MSU Northern	1211 NW Bypass Great Falls

Notices alerting the public to these opportunities were posted on DEQ's Internet site and on the SWPP homepage. A press release was also distributed for statewide publication in an effort to alert as many people as possible to the planned meetings. Additionally, the press release referenced the SWPP homepage that contains the draft document, a document summary, and key issues. This site provided a mechanism to submit comments directly to DEQ electronically.

The SWPP Newsletter also included information concerning the planned public meetings. The newsletter is distributed to all citizens or groups who have expressed interest in the program and to those DEQ identifies as potential stakeholders based on EPA's guidance but who chose not to participate on the advisory council.

9.5 Making the Assessments Available to the Public

Delineation and assessment reports will be completed pursuant to Appendix J and will be made available to the public through several different avenues as required by the SDWA. DEQ will provide information in a specialized format upon request to address special audiences and any identified special multilingual, visual and audio presentation needs. The primary means will be through the SWPP homepage on the Internet. This page will use a point and click system that allows the user to move from PWS identified on a map of Montana to the specific delineation base map.

Information obtained from the SWPP homepage will allow the user to view a base map, delineation overlay, general contaminant source inventory, and land use overlay for their PWS. An executive summary of the report including a summary of the susceptibility assessment also will be attached to the base map. More detailed information including locations of potential contaminant sources and detailed descriptions of specific potential contaminant sources will be available directly from DEQ or the PWS. These will include a map showing the delineated area, potential contaminant sources, and the susceptibility assessment.

DEQ will make delineation and assessments available to the public by placing the reports in local libraries and at county health departments across the state. Completed reports will be compiled into a notebook to be sent to libraries and health departments near each PWS. DEQ will update the notebooks annually. Additionally, DEQ will issue a press release whenever the notebooks are updated to alert the public to their availability. The press release will go to local and regional print media and radio.

Community PWS will include source water assessment information in their consumer confidence reports (CCRs). When a PWS has received or completed a source water assessment report, customers must be notified in the CCR that the report is available and where to obtain it [40 CFR 141.153(b)(2)]. The CCR also must include a brief summary of the system's susceptibility to significant potential sources of contamination. The summary will be provided by DEQ or written by the operator.

Montana will continue to publish and distribute the SWAP newsletter. The newsletter will be reproduced in the biannual DEQ publication entitled A*Montana Clearwater@* and will include instructions on how to access SWPP information via the SWPP homepage. *Montana Clearwater* is distributed to all water and wastewater operators in the state. Notification on how to access these reports will be placed in the quarterly MRWS newsletter. In addition, DEQ will describe the availability of source water assessments in the 305(b) report, a periodic report on the status of the state's surface water, groundwater, and wetlands.

The delineation and assessments will be available to the public upon completion of the report review process described in Section 10.1.3.

SECTION 10

10.0 Source Water Assessment Program Implementation

10.1 Montana Source Water Assessment Program Workplan

Section 1452 of the federal Safe Drinking Water Act authorizes states to establish a state loan fund and capitalizes the fund to make money available to PWS for infrastructure development. A portion of the fund can be set aside to fund administration of other requirements of the Act. The source water assessment program is funded through these state revolving fund set-asides.

The federal *Drinking Water State Revolving Fund (SRF) Program Guidelines* requires each state to submit a work plan indicating how funds will be spent when set-asides are used. The work plan outlined below was prepared according to the SRF Guidelines and the EPA's *AState Source Water Assessment and Protection Programs Guidance.@*

10.1.1 Funding Amount

The Source Water Protection Section at DEQ met with the SRF Advisory Committee in October 1997 and April 1998. This committee is responsible for providing oversight to DEQ on the use of SDWA set-asides. Initially, DEQ proposed using half of the allowed SWAP set-aside to develop and implement the program. Discussions with the State Drinking Water Revolving Fund Advisory Committee led the committee to recommend that DEQ should use the entire set-aside amount allowed as reflected in this section.

The total set-aside from the SRF allotted for source water assessment and protection activities is estimated at $1,482,620 (10 percent of the FY=97 capitalization grant dollars). This funding is a one-time set-aside that was available from the 1997 fiscal year allotment and had to be applied for no later than September 30, 1998. DEQ can bank the money, giving them up to four years to complete source water delineations and assessments. In addition, no match is required for the SWAP set-aside. Costs budgeted as shown in Table 10 reflect the need to prioritize which PWS will receive the more in-depth delineation and assessments. Estimates of costs to use the analytical method described in Appendix H at all PWS exceed funds available by at least $450,000 based on rough, per system estimates (Note: Montana had 607 community PWS in September 1999).

SRF set-aside money will be used to conduct source water assessments and delineations on a priority basis as established by SWAPAC. The scope of this program is broad and the level of services offered will depend on the funds available. Other funding sources may be used to supplement this effort. These funds may include money earmarked to administer or provide technical assistance through source water protection programs and potentially other funding sources or special grants. Section 106 Ground Water funds will continue to be used for the WHPP to assist in developing plans to protect groundwater. While section 106 funds support source water assessment activities, it will be maintained as a separate account focused on developing and implementing source water protection plans.

10.1.2 Full Time Employees

DEQ will use a minimum of 2.5 full time equivalent employees (FTE) to develop and implement SWPP. These positions include two full-time water quality specialists, and one half-time position for data management or administrative support. Additional support from management, fiscal and administrative areas and various programs in the department will be provided as needed.

Purpose	Resources	Cost / Year	Total Cost Through 2002
Assist in SWAP development, complete delineations and assessments, write/oversee contracts for delineations and assessments (beginning in FY99).	2 FTE + operating expenses and support	$ 67,000 per FTE X 2 FTE for 4 years	$ 536,000
Data management and /or administrative support for SWAP development and delineations/assessments.	0.5 FTE + operating expenses	$ 35,000	$ 140,000
Delineate protection areas and inventory potential sources including complex and large source water protection areas. Provide management, oversight, direction, and coordination of contractors and with other programs.	Other Services*	(375 systems X 40 hours per system x $50 per hour)	$ 750,000
Support source water protection program.	Equipment and Training		$ 56,620
Obtain EPA approval of Montana's source water protection program, delineate areas for all public water supplies, and inventory pollution sources.	Total of 2.5 FTEs other services and equipment	Total Cost:	$ 1,482,620

* Other Services refers to services provided by DEQ personnel and/or contractual services

Table 10. Source Water Assessment Program personnel funding.

10.1.3 Goals and Objectives, Outputs, and Deliverables

The goal of the source water assessment program is to protect and benefit public water systems by delineating source water protection areas, identifying potential contamination sources, and assessing the susceptibility of the water supply to identified potential contaminant sources. Montana developed a GIS-based approach that uses digital raster graphics as the base map for each PWS upon which the delineation will be overlain. The origins of regulated contaminants with acute health effects or those that have been detected through PWS monitoring are deemed to be significant and are the focus the contaminant source inventory. Other potential contaminants may be deemed to be significant at the discretion of DEQ. Susceptibility is assessed based on proximity of potential contaminant sources or specified land uses and the presence of manmade or natural barriers that are effective at impeding potential contaminant movement. The results of delineations and assessments are made available to the public through the PWS and local health departments and by posting on DEQ's Internet site. Overall, the goal of Montana's

Workplan for SRF set-asides is to complete the source water assessment program within the time frame allowed by the SDWA.

The following activities were completed to meet the goal:

- Organize SWAPAC meetings. These meetings were held in June, September, and December 1998, with another in October, 1999.
- Develop the source water assessment program document for EPA approval.
- Host four regional stakeholder meetings.
- Develop and administer contracts for a portion of the assessments.
- Complete source water assessments for all PWS in Montana in line with established priorities.
- Provide the results of the assessments to PWS and the public.
- Provide assistance to local communities in the development of source water protection plans.

DEQ implemented components of SWPP while awaiting EPA approval (to be charged against set-aside funds). This included completing delineations and potential contaminant source inventories in accordance with Montana's EPA-approved WHPP for PWS dependent on groundwater. Personnel time to develop SWPP and associated computer hardware/software also was charged against set-aside funds prior to full program approval. Set-aside funds were not used to conduct delineations and assessments for systems dependent on surface water sources or combined surface water/groundwater sources or for the susceptibility analyses for any systems.

The outputs include:

- Source water assessment program document.
- Possible contracts with entities outside the department to conduct assessments.
- Public meeting summaries.
- Completed assessments including maps with delineated areas and potential pollution sources and results of susceptibility assessments.
- Results of assessments made available to the public through paper and electronic format.
- The source water assessment program document and completed delineations/assessments are the deliverables for this set-aside.

The delineation and assessment report review process for reports completed by DEQ includes submittal of the draft map and all delineation and assessment supporting documentation to the PWS for review and comment during a 60-day comment period. PWS comments and DEQ responses will be documented in the

report and final certification will be made by DEQ within 45 days. Comments resulting in recommended changes to the report that cannot be agreed upon by DEQ and the PWS will be noted but responsibility for content of the final report will rest with DEQ.

Reports completed under contract by a PWS (see Section 10.2) and submitted to DEQ will be required to include the draft map and all delineation and assessment supporting documentation. Following a 60-day review period, DEQ comments and PWS responses will be documented in the report. Final certification will be made by DEQ within 45 days. Any changes to the report that DEQ recommends that cannot be agreed upon by DEQ and the PWS will be noted but responsibility for content of the certified report will rest with DEQ.

Certification by DEQ means the report or plan has been reviewed by DEQ and appears to substantially meet the requirements of the federal SDWA and the SWPP.

10.1.4 Schedule

DEQ's schedule for implementing this set-aside follows:

Activity	Before this Date
Organize Technical Advisory Committee.	July 1, 1998
Prioritize public water supplies for SWAP.	October 30, 1998
Submit the Intended Use Plan Workplan to EPA.	August 12, 1998
Draft source water assessment program document.	October 30, 1998
Hold regional stakeholder meetings.	October-December
Submit final SWAP document to EPA.	February 1999
Obtain EPA approval of source water assessment	November 1999
Negotiate contracts as needed to complete	January 2000
Complete all source water assessments and provide assessment results to the public.	May, 2002*

DEQ is requesting an 18-month extension allowed for completion of source water delineations and assessments but is estimating the budget only through May 2002 since it appears all funds will be expended by that time.

DEQ will begin full implementation of the program immediately after approval by EPA.

10.1.5 Responsibilities of agencies involved in implementing set-aside

DEQ is responsible for implementing the SRF set-aside for source water assessment. The involvement of various programs within DEQ or entities within the state is described as follows:

Planning, Prevention, and Assistance Division, Pollution Prevention Bureau, Source Water Protection Section will be responsible for implementing SWPP. Source water protection staff organized and directed SWAPAC meetings, developed the SWPP, and organized public meetings. During the implementation period they will conduct assessments, negotiate and administer contracts to complete assessments (up to 50 percent of the delineation/assessments may be completed via contract), coordinate and assist local communities in source water assessment and protection efforts, and provide information on potential contaminant sources. In addition, the source water protection section will continue to administer the Comprehensive Ground Water Quality Protection Program in Montana.

Montana Tech of the University of Montana, Montana Bureau of Mines and Geology will participate on the Technical Advisory Committee, conduct assessments, provide information on potential pollution sources, provide computer expertise for assessments, and assist in collecting potential pollution source information.

Permitting and Compliance Division, Community Services Bureau, Public Water Supply Program provide water supply and sanitary survey data, assist in the

dissemination of assessment information to PWS through consumer confidence reports, and provide the main contact with PWS.

Planning, Prevention, and Assistance Division, Technical and Financial Assistance Bureau, Water and Waste Funding Program administer the Drinking Water State Revolving Fund Program.

Others agencies and organizations will assist or participate on the Technical Advisory Committee and may conduct some assessments. This group may include Montana Department of Agriculture, Montana Rural Water Systems, Inc., local water quality districts, USGS, universities, and tribes.

10.1.6 Evaluation Process to Assess Success

The success of source water assessment efforts undertaken with SRF set-aside funds will be measured in a variety of ways. Initially, success will be demonstrated by developing and implementing the Montana Source Water Assessment Program on schedule and in accordance with the EPA approved program. Other measures include: the number of local source water protection programs developed as a result of the assessments, and the number of real pollution sources threatening PWS that are cleaned up, removed, or remediated.

10.2 Delegation and Pass-through Grant Option

"Pass through grant funding no longer available. July 2004"

DEQ developed a pass-through grant option to delegate and fund source water delineation and assessment activities by selected PWS. Delegation means that DEQ may assign the responsibility to complete a delineation and assessment to a community or non-transient PWS upon request by the PWS.

The pass-through grant option allows qualified and selected PWS to use funds set aside by DEQ to complete delineation and assessment for themselves. This mechanism is intended to help ensure that source water assessments are implemented effectively within the funding and time constraints established by the SDWA. Through this option, DEQ can leverage set-aside funds by coordinating with other activities under existing water projects or by combining several PWS delineations and assessments. The pass-through grant option also will help ensure Aownership@ for delineation and assessments is developed by PWS. Developing PWS ownership should lead to greater follow through resulting in development of local plans to protect source waters. Pass-through grants will be available for either community or non-transient non-community PWS but not for PWS that purchase all their water, non-public water systems, or non-community transient public water systems.

The Source Water Protection Section is responsible for managing this grant option to be implemented through a contract between DEQ and the participating PWS. The contract will allow DEQ to pay for costs incurred by the PWS for delineation and assessments completed pursuant to the Montana Source Water Protection Program. The contract will specify the terms under which payment can be made including tasks to be completed, timetables, and deliverables. Generally, contract terms will state the time allowed for completion and will specify that the deliverables include a DEQ certified delineation and assessment report completed pursuant to Appendix J. The contract will also specify that public notice be issued at project onset so stakeholders can be offered an opportunity to participate. DEQ will contract with PWS that can either perform the work directly or subcontract it. DEQ will be as flexible as possible in considering the individual needs of PWS and partnerships that are formed, with the goal of ensuring solid PWS ownership in the effort and the eventual completion of a protection plan.

Generally, the pass-through-grant option may be used to fund PWS delineation and assessment costs at qualified PWS. DEQ may contribute up to $3,000 for a delineation and assessment project at qualified and selected PWS serving less than 1,000 persons, when the DEQ contribution is matched with a contribution from the PWS which is at least 40 percent of

total project cost. The match may be in the form of in-kind service, may include costs incurred by the PWS directly for delineation and assessment work, and may also include documented costs incurred in the development of a source water protection plan. DEQ may contribute up to $5,000 for a delineation and assessment project at qualified and selected PWS serving 1,000 or more persons when matched with a contribution from the PWS which is at least 40 percent of total project cost.

Other SWAP delegation opportunities are described more fully in Appendix M.

A total of $750,000 is available through the end of fiscal year 2002 to fund this option. Demand for funds is likely to exceed available funds, hence the use of ranking criteria is needed to guide DEQ in selecting and prioritizing PWS requesting pass-through grant funds.

10.3 Ranking Criteria and Procedures

DEQ established a SWPP project proposal review committee to review and rank proposals submitted by PWS using pass-through grant money. The committee consists of three DEQ staff; two representing the SWP Program and one representing the PWS Program. Proposed projects must score at least 125 points to be eligible for this option. Some projects that score 125 points or higher may not be funded if demand exceeds available funds.

General factors considered when ranking proposals include: intersystem susceptibility; size of population benefiting from a project; demonstrated local support for a project; demonstrated leveraging of funds supporting an existing project; and demonstrated resolve to utilize the delineation and assessment in the development and implementation of a local or regional source water protection plan. Appendix M provides guidance to PWS and the review committee by describing how the review committee will consider these factors in the ranking process. DEQ reserves the right to deviate from these criteria based on funding limitations or unforeseen factors. A maximum amount of grant funds available will be specified for each fiscal year of the program. DEQ will review Appendix M periodically and amend it as needed.

10.4 Progress Reporting

DEQ will report to EPA on the progress of program implementation through a biennial status report. This report will be combined with Montana's wellhead protection biennial report and will follow the same time-cycle. The biennial report will include a discussion of progress made during the reporting periods, significant problems encountered, and any amendments to the state program.

The Montana Source Water Protection biennial report will also be made available to the public via DEQ's SWP Internet site.

10.5 Implementation Deadline Extension Request

The Montana drinking water state revolving fund advisory committee recognized the large scale of this program and strongly recommended DEQ set aside the full funding amount. The Montana Source Assessment Program Advisory Council also recognized that not only will a large effort be required to implement the program but time is needed to develop the critically needed interest and cooperation of stakeholders. This council recommended that DEQ should request the available implementation deadline extension.

DEQ intends to develop the program to complement the developing watershed protection program and the TMDL effort currently underway. Some time will be required to make existing data readily available internally to other programs at DEQ and externally to stakeholders. Problems that may occur during implementation will probably mean additional delays in the schedule. Additional time beyond the 2-year deadline is needed. Montana formally requested the 18-month extension to the implementation deadline as provided for in the SDWA.

SECTION 11

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